PRE-CONVENTION NUMBER
SEPTEMBER, 19

Railway Engineering and Maintenance

THE BEST IN RAIL JOINTS

Less Maintenance
Longer Rail Life

"maintenance men" by the keg

Edgemark of Quality

- Automatically, the non-fatiguing reactive pressure developed by Reliance Hy-Crome Spring Washers keeps track joint bolts under constant tension, compensating for looseness in the assembly resulting from wear, bolt elongation or temperature changes.
- Constant research, testing and close control of manufacturing procedure used in the production of Reliance Hy-Crome Spring Washers help *you* cut maintenance costs, keep rail joint bolts *tighter longer*, lengthen time between maintenance and maintain a better rail end condition.
- Our sales engineers will gladly discuss test installation and test data with you.

RELIANCE hy-crome SPRING WASHERS

EATON MANUFACTURING COMPANY, RELIANCE DIVISION

OFFICE AND PLANTS • MASSILLON, OHIO

SALES OFFICES: NEW YORK • CLEVELAND • DETROIT • CHICAGO • ST. LOUIS
SAN FRANCISCO • MONTREAL

AVOID FREEZE-UPS *WITH* Winter Kings

One of the best ways to beat freeze-ups at switches and slips is to install Bethlehem Winter Kings. These low-cost heaters fight snow as it falls, melting it so quickly that dangerous layers of ice have no chance to get a foothold.

The Winter King fits easily between ties so that its heat can be applied directly beneath rail and switch point. The flame is shielded on both sides to prevent scorching of ties and to protect against wind. It stays alive even in strong gusts and storms of blizzard proportions.

Note the sliding cover on top of the housing—a simple device for controlling the flame. Merely loosen the nut and move the cover backward or forward. This easy adjustment permits a bigger flame or cuts it down to almost nothing, as you prefer.

Winter Kings use inexpensive kerosene, and one filling will last for many hours of constant burning. Fuel can be added while the heater is in full operation.

Now is a good time to install Winter Kings . . . before the big snows arrive. You'll find these heaters easy to maintain and economical both in first cost and on the job. Order soon and avoid the seasonal rush.

BETHLEHEM STEEL COMPANY, BETHLEHEM, PA.

On the Pacific Coast Bethlehem products are sold by Bethlehem Pacific Coast Steel Corporation. Export Distributor: Bethlehem Steel Export Corporation

BETHLEHEM STEEL

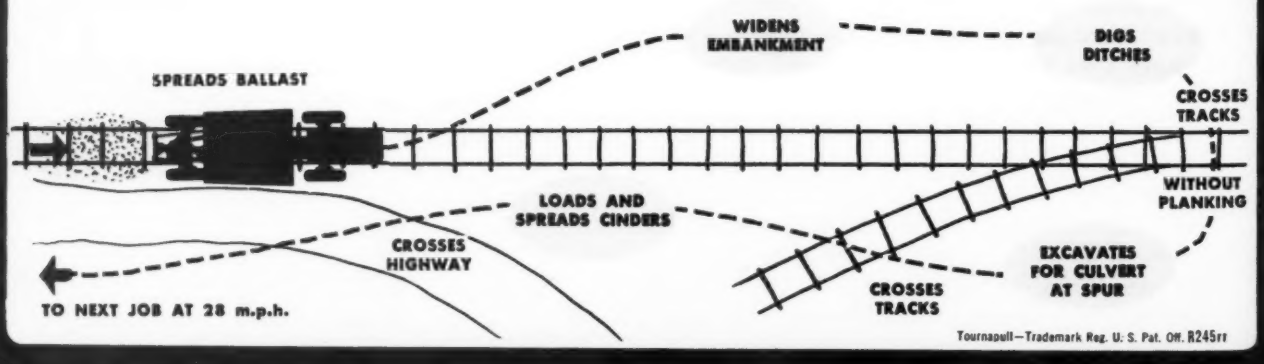
Published monthly by Simmons-Boardman Publishing Corporation, 79 W. Monroe St., Chicago 3,, Ill. Subscription price: United States and Possessions, and Canada, $2.00 for one year; $3.00 for two years. Single copies 50 cents. Entered as second-class matter January 20, 1933, at the post office at Chicago, Ill., under the act of March 3, 1879, with additional entry at Marion, Ind., post office. Address communications to 79 W. Monroe St., Chicago 3, Ill. Volume 47, No. 9.

heck these reasons wh

D Roadster TOURNAPULL

maintains more t

Typical *D TOURNAPULL* performance as rail maintenance "handy-man"



Tournapull—Trademark Reg. U. S. Pat. Off. R245rr

R. G. LeTourneau Inc.

PEORIA, ILLINOIS

e track at a lower cost per mile

1 Handles ballasting, stockpiles, finish grades

9-ton, 7-yd. D Roadster Tournapull is especially adapted to handle your scattered ballasting assignments. With the scraper-bulldozer combination on this one tool you can self-load ballast or load the scraper with aid of clamshell . . . then travel down main lines and spread in thin controlled layers where needed. It is ideal for hauling ballast to scattered spots where small sections of track are being raised. Bulldozer blade "floats" on rails and acts as depth shoe for leveling ballast. In winter you substitute a V-Type snow plow for the bulldozer blade and use your D Tournapull for clearing snow from sidings, yards, etc. Other interchangeable hauling units give you flexibility which means economical use of manpower and equipment . . . saves you time and money all year-round.

2 Modern rubber-tired speeds for quick moves . . . fast maintenance

This high-speed, all-purpose machine has a top speed of 28 m.p.h. You get off right-of-way fast at approach of rail traffic . . . no running to rail sidings and holding up work crews while trains roll by. And the minute rail traffic has cleared, you get back onto right-of-way and to work. Fingertip electric controls give you easy, accurate control of scraper operations and steering. One-man operated D Roadster will prove an outstanding performer on your right-of-way grading, sloping and ditching assignments.

3 Cuts downtime for weather with Tournamatic differential

Big, low-pressure tires improve traction when working in mud, sand, or soft fills. Two-wheeled prime mover wastes no tractive weight on extra steering wheels. With LeTourneau power-proportioning differential, 4 times more power is applied to wheel having firmest footing. Positive power steer shifts footing as needed for better pull. All these features speed up work cycles and take unit through where others stall . . . cut downtime due to bad weather . . . assure longer work season . . . more miles serviced.

4 Travels job-to-job, along right-of-way, highways, cross country

Your D Tournapull can be driven job-to-job under its own power and carry its own supplies . . . saves you time and cost of hauling on flat cars on most moves. 25 miles is only an hour away with this high-speed tool. The "D" is ideal for "work-and-run" assignments. You speed up maintenance anywhere along the right-of-way all year-round . . . eliminate delays in rail traffic . . . save dispatching work trains. With big tires, "D" crosses tracks, follows rail lines anywhere without damage to rails, switches, etc. Tires do not chamfer ties, subjecting them to costly cracking due to weather.

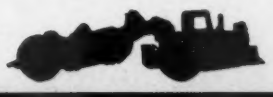
5 Faster to operate . . . less fatigue for operator

Your regular maintenance-of-way crew can become competent operators in a short time. Push-button electric switches on dashboard simplify operation . . . make "D" faster, easier to control. Big low-pressure tires, air-foam seat, quieter operation eliminate a lot of operator fatigue . . . allow safer, faster, steadier operation with less manpower. These advantages plus better operator cooperation mean a substantial increase in right-of-way serviced . . . more jobs completed per year. Contact your LeTourneau Distributor for all the facts . . . or, better still, arrange a demonstration on your roadbed.

Attachments and interchangeable EQUIPMENT:

7-TON CRANE

V-TYPE SNOW PLOW


BULLDOZER BLADE

REAR-DUMP HAULER

Send for complete facts to: R. G. LeTOURNEAU, INC., Peoria, Illinois

Am also interested in D Tournapull for use with: ☐ V-Type Snow Plow ☐ Bulldozer ☐ Rear-Dump Hauler ☐ 7-ton Crane

Name..... Title.....

Department.....

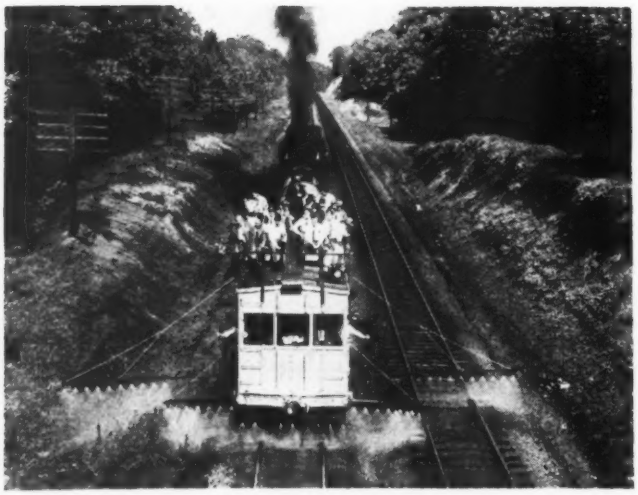
City..... State.....

Am also interested in: ☐ V-Type Snow Plow ☐ Bulldozer Blades ☐ Rear-Dump Hauler ☐ 7-tonCrane

LeTOURNEAU LeT EQUIPMENT

RELIABLE HERBICIDES—

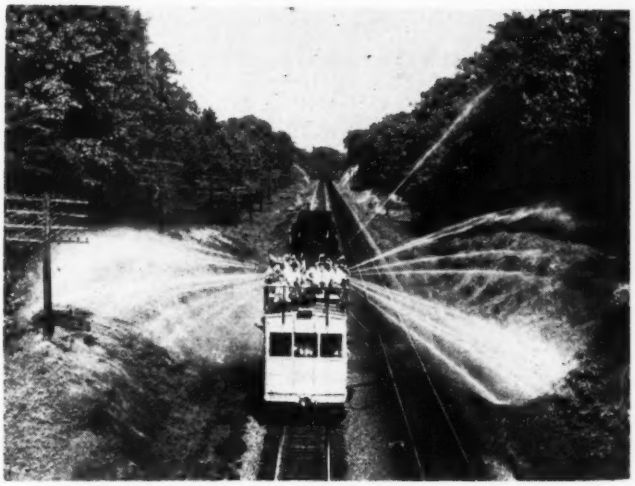
For Roadbed Treatment



Newly constructed spray cars provide many new features designed to efficiently apply chemical weed killers to roadbed with complete coverage.

Right-of-way Treatment

HIGH PRESSURE GUNS, CAPABLE OF COMPLETELY SATURATING TROUBLESOME BRUSH WITH BRUSH KILLING CHEMICALS, ARE MOUNTED ON NEW SPRAY CARS. FULL COVERAGE OF 100 FEET EITHER SIDE OF CENTER OF TRACK CAN BE ACHIEVED.



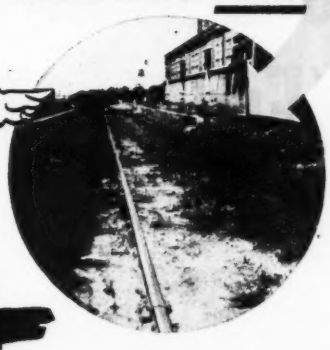
Complete Weed and Brush Killing Service

THE R. H. BOGLE COMPANY

ALEXANDRIA, VIRGINIA

ATLANTA, GA. **MEMPHIS, TENN.**

If your yards look like THIS...



Instead of like THIS...

...then YOU need the

NORDBERG
DIRT SWEEPER LOADER
YARD CLEANER

WHY put up with dirty, hazardous yard trackage . . . when you can have *really* clean, safe and efficient yards, *mechanically* with the Nordberg "DSL" Yard Cleaner!

This versatile Yard Cleaner cleans track faster, better, and at a much lower cost. It cleans right down to the ties—and without damaging them.

It is a self-propelled unit with traveling speeds up to 15 mph. It moves on the rails with two in-gathering plows grading the intertrack and feeding material into an impeller. The impeller lifts this material and also that on the ties, cleaning off the web and base of the rail as well. It then deposits the material on two cross conveyors which in turn feed a 25-ft. wasting conveyor for disposal into cars on an adjacent track, into dump body push trucks or over the bank—as desired.

Having completed the cleaning job, the Nordberg "DSL" Yard Cleaner is easily removed from the track with a hydraulically-actuated run-off device.

Call or write for new descriptive catalog—ask for "BULLETIN 189"

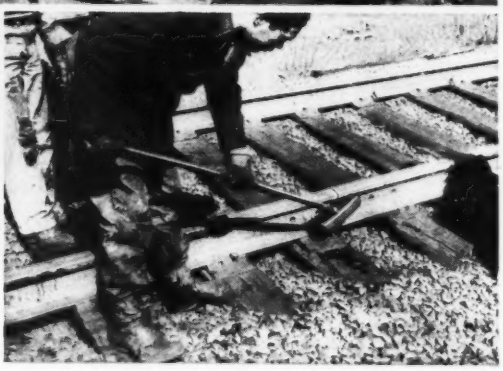
R 851

Look to **NORDBERG**

. . . for continually improved TRACK MAINTENANCE MACHINERY *to do a Better, Faster Maintenance Job at Lower Cost*

NORDBERG MFG. CO., Milwaukee 7, Wisconsin

Here's how to eliminate "Frozen Joints"



1. Use the oxy-acetylene flame to loosen mill scale, and drive out moisture from around the joint area.

2. Next wire-brush the area to remove the loose scale.

3. Then paint the area with a good lubricant.

Now, these clean joint areas—free of troublesome mill scale—will discourage joint bars from "freezing to the rail" and will require less maintenance.

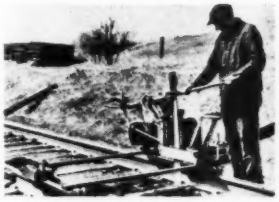
This operation takes a little over a minute to do, and will fit right into your present rail-laying program. Ask OXWELD for more information about how you can use flame-cleaning to prevent joint bars from freezing to rail ends when you lay new rail.

OXWELD RAILROAD SERVICE

OXWELD RAILROAD SERVICE COMPANY
A Division of Union Carbide and Carbon Corporation
UCC
Carbide and Carbon Building Chicago and New York
In Canada:
Canadian Railroad Service Company, Limited, Toronto

SINCE 1912 THE COMPLETE OXY-ACETYLENE SERVICE FOR AMERICAN RAILROADS

SAFETY FIRST WITH Woolery MAINTENANCE EQUIPMENT

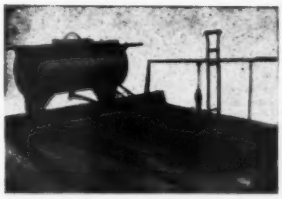


WOOLERY Tie Cutter and Undercarriage enables one man to quickly cut each tie into three easily removable pieces without disturbing ballast. Entire cutting operation is performed without lifting or turning machine. Total cutting time is less than two minutes per tie!

WOOLERY self-propelled Off-Track Joint Oiler manned by 3 operators can spray joints on 1½ miles of track per hour. Uses heavy lubricants preheated in 25 gallon tank and sprayed into joints under pressure for thorough, long-lasting lubrication. Only 30" wide for easy turn-around between double tracks.

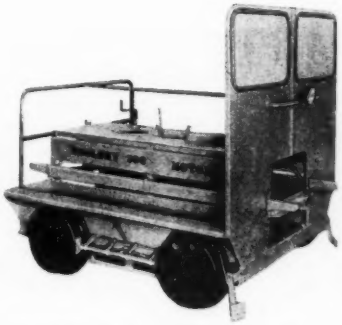
RAILWAY WEED BURNERS
•
CHEMICAL WEED SPRAYERS
•
TIE CUTTERS
•
TIE PLATE SPACERS
•
TIE SPRAYERS
•
RAIL JOINT OILERS
•
MOTOR CARS
•

SAFER ROADBEDS—easier, quicker and at lower cost with Woolery equipment. On leading railroads, all over the world, the importance of proper equipment is dependent upon these specialized Woolery products. The quality and efficiency of Woolery equipment have been proved through 34 years of continuous service.

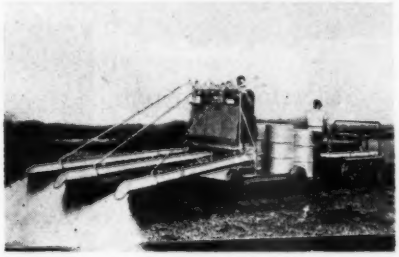


WOOLERY Tie Sprayer with 60 gallon tank capacity. Generator-burner heats creosote. Protective hood safeguards operators. Applies a metered amount of creosote to each freshly adzed tie. Safer, more economical and more uniform than old fashioned hand swabbing or broom and pail methods.

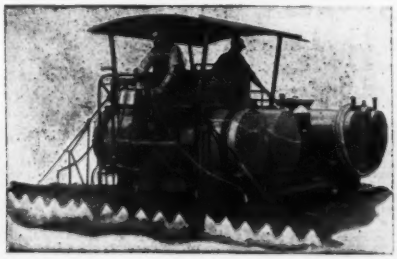
WOOLERY Tie Plate Spacer, quickly and accurately locates single or double shoulder plates at exact position on ties. So light in weight, one man can easily handle it on or off track. Simple adjustment allows for changes in rail sizes. A great time saver.



WOOLERY No. 300 Motor Car gives advantages of a light car plus greater pulling power with four wheel drive and heavy duty performance. Carries eight men with track tools. Can be fitted with detachable WOOLERY Flangeway Cleaner for winter duty.



WOOLERY Weed Burner model PB-B has three burners and will completely destroy a swath 15 feet wide on first trip and 25 feet wide on return trip with burner arms extended. Other sizes include one to five burner models to fit all requirements. Can be operated in winter as snow melters.



WOOLERY dual purpose Combination Sprayer and Weed Burner permits choice of chemical spraying (near buildings or in areas where burning is prohibited) or weed burning, as desired. Chemical sprayer covers 18 foot swath. Burning unit at opposite end covers 15 feet first trip; up to 25 feet second trip.

WRITE FOR LITERATURE AND COMPLETE SPECIFICATIONS

SINCE 1917 RAILWAY MAINTENANCE EQUIPMENT

Woolery MACHINE COMPANY

2919 COMO AVE. S. E. MINNEAPOLIS 14, MINN.

Exclusive Export Representatives

PRESSED STEEL CAR CO., NEW YORK, N. Y.

Here's Where I Get My **POWER** to Speed Repairs and Cut Costs

Use a Homelite Dual Purpose Generator for operating a Homelite High Cycle Chain Saw, or for grinders, drills, concrete vibrators or for other high cycle tools.

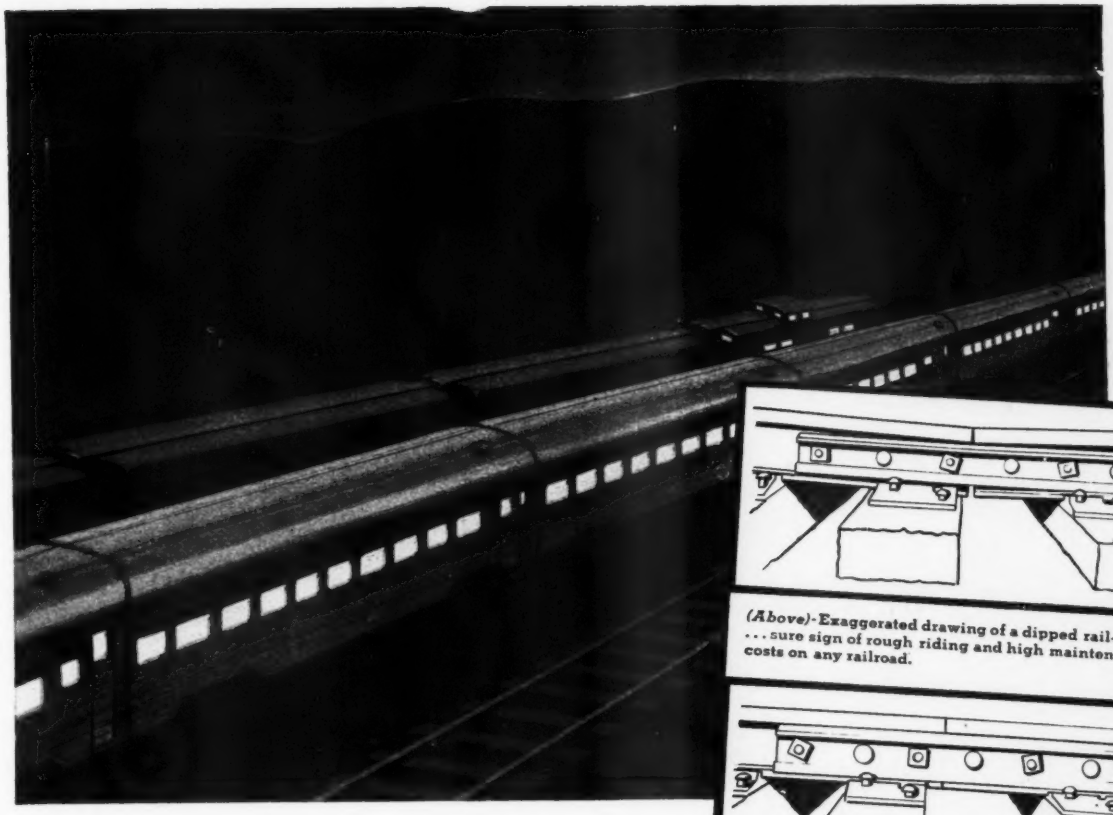
Use a Homelite Dual Purpose Generator to operate standard universal tools . . . hand saws, drills, etc. . . . or for floodlights on night emergency repair work.

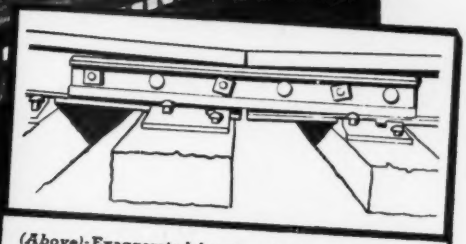
Yes sir! This Homelite Dual Purpose Generator has been a real help to railroad maintenance men. The first of its kind ever developed, it opened up the doors for real savings in maintenance work through the use of faster, lighter, more efficient high cycle tools. Light enough for one man to carry, this gasoline-engine-driven generator is easily and quickly put on location. Instantly . . . and without long troublesome cables . . . it supplies power for high cycle tools. And being a dual-purpose generator, it will supply power for standard universal tools as well. Ask for free demonstration.

Manufacturers of Homelite
Carryable Pumps • Generators
Mowers • Chain Saws

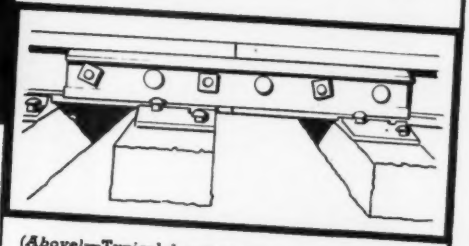
PERFORMANCE · DEPENDABILITY · SERVICE

HOMELITE
CORPORATION
209 RIVERDALE AVENUE • PORT CHESTER, N. Y.





(Above)-Exaggerated drawing of a dipped rail-joint . . . sure sign of rough riding and high maintenance costs on any railroad.



(Above)—Typical drawing of a rail-joint brought to exact level *to stay* with the individually operated tamping arms of the Matisa Tamper.

(Below)—Tamping shoes of Matisa Tampers *do not* pound ballast to powder—vibratory pressure action compacts ballast *under* ties, as well as at sides.

SMOOTH RUNNING ON *Matisa*-TAMPED JOINTS

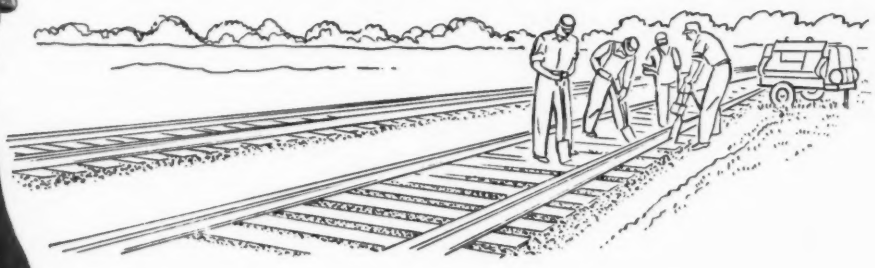
LEVEL track and smooth joints speed schedules, save track and equipment maintenance, make passengers rail travel boosters . . . And this is the track you get with Matisa precision tamping . . . The only power tamper available that compacts while vibrating *under ties* for level joints and rails that *stay level.*

Write to our M. W. Engineering Department for full details.

THE MATISA EQUIPMENT CORP.
224 South Michigan Blvd. • Chicago 4, Illinois

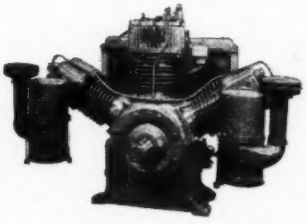
ALL OVER THE WORLD
Matisa TRACK MAINTENANCE SPECIALISTS

watch them at work!

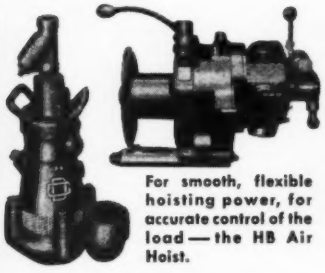


and see for yourself how GARDNER-DENVER equipment saves you man-hours and money!

For low-cost air power anywhere along the right-of-way — the WH-105 Portable Compressor.



For yards and shops — as well as air brake and signal service — Gardner-Denver WXE Air-Cooled Compressor.



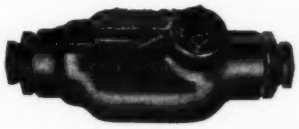
For smooth, flexible hoisting power, for accurate control of the load — the HB Air Hoist.

For de-watering muddy sumps, pits, tanks, etc. — the dependable VP4 Pneumatic Sump Pump.

For fast concrete demolition, with extra safety for the operator — the B87 Paving Breaker.

For solid tamping — the smooth-handling, easy to maintain T23 Backfill Tamper.

For easy digging in clay or hardpan — the Model 28 Clay Digger and 128 Trench Digger.



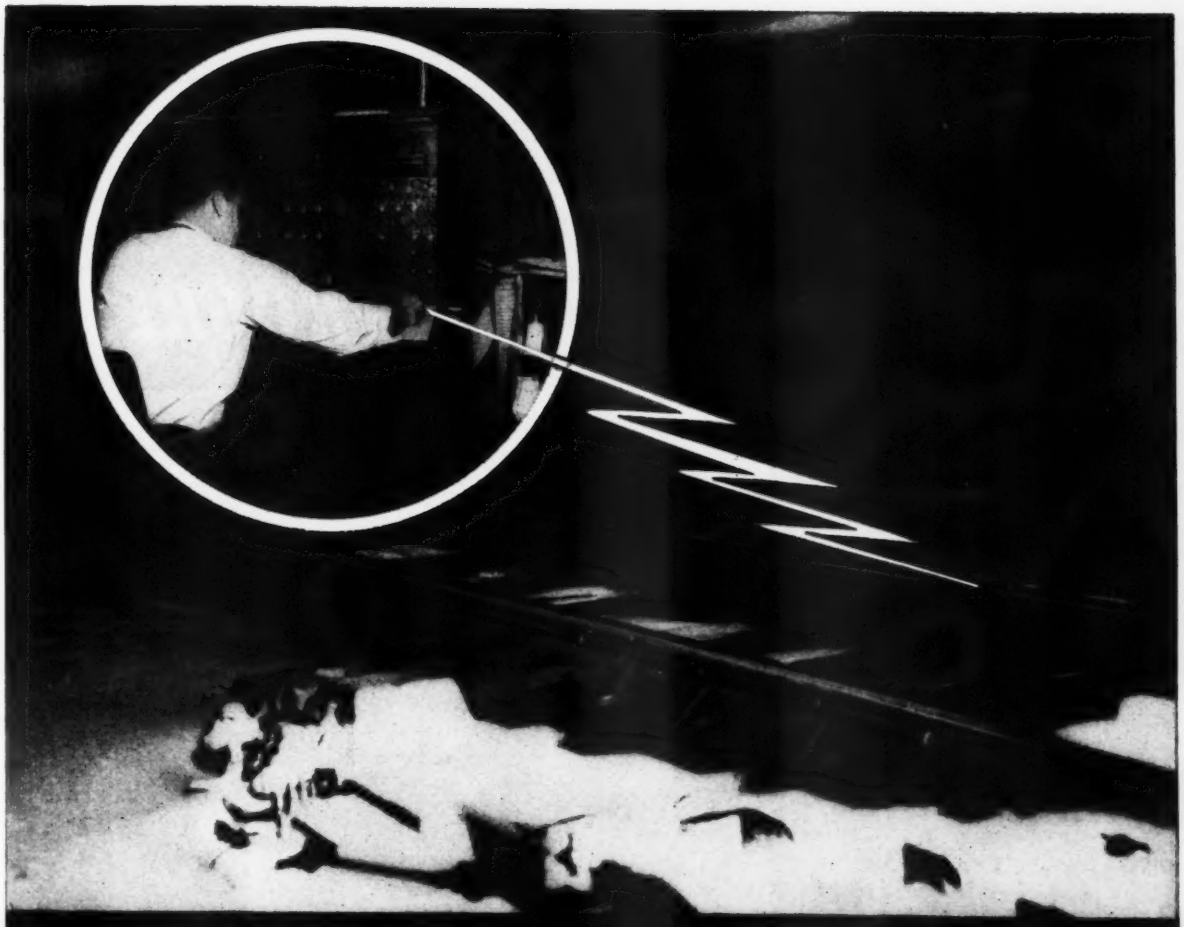
For positive protection of all pneumatic equipment — the L012 Automatic Line Oiler.

Let us tell you how Gardner-Denver quality compressors and air tools pay for themselves by saving man-hours and maintenance dollars. Write today for complete information.

GARDNER-DENVER *Since 1859*

Gardner-Denver Company, Quincy, Illinois.
In Canada:
Gardner-Denver Company (Canada), Ltd., Toronto, Ontario.

For additional information, use postcard, pages 783-784



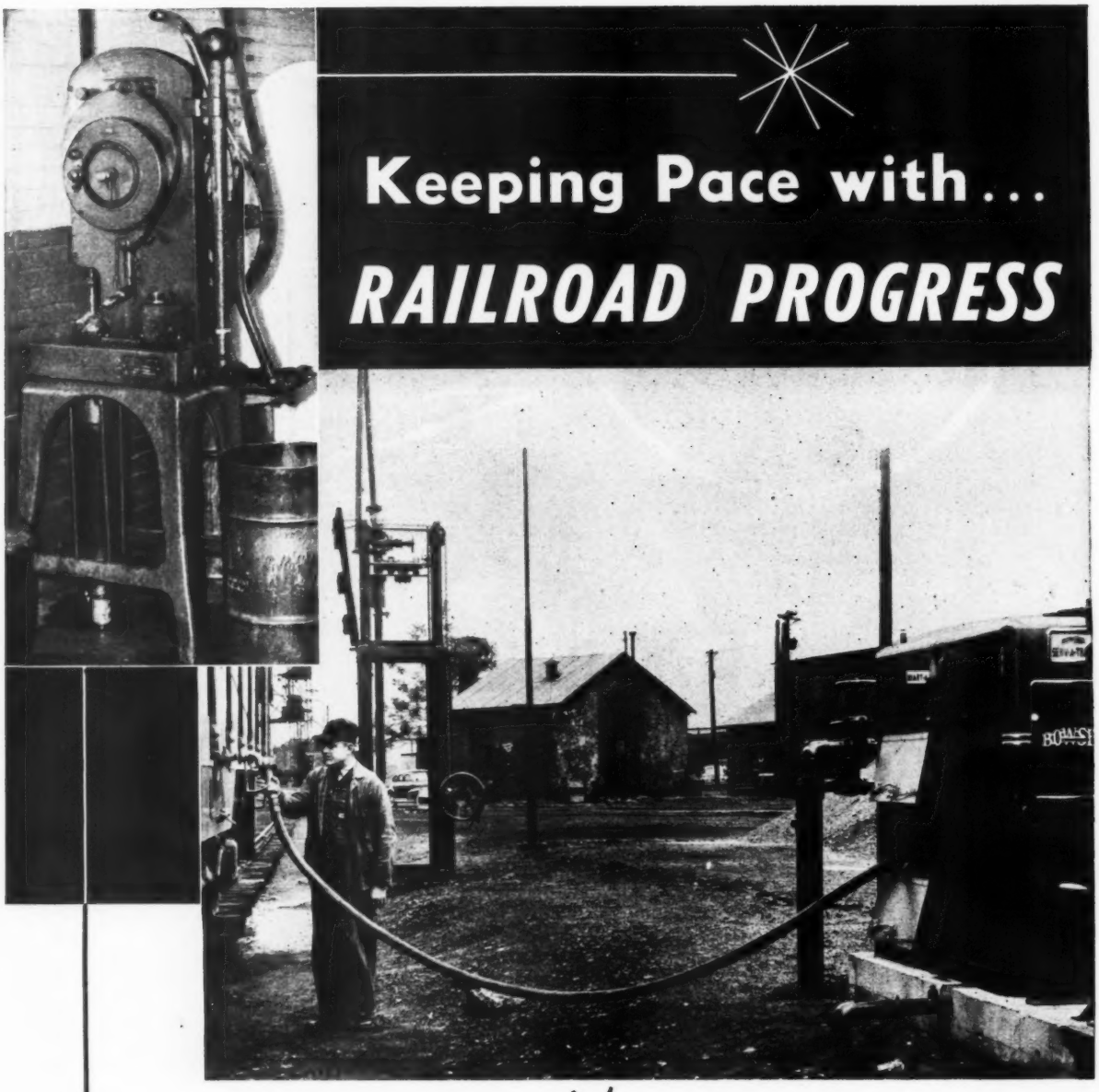
At the Flick of a Switch...

. . . the HEAT'S ON 80 miles away . . . insuring continuous operation of the switch shown above. It is one of four in an isolated location protected day and night with Rail-Tel Propane Switch Heaters. Remote control permits the dispatcher to put these heaters in instant operation the moment a storm warning is received.

Rail-Tel Propane Switch Heaters are now used by many railroads throughout the country for economical and dependable protection of both isolated switches and all types of interlocking plants. These modern heaters, whether operated by manual or remote control, assure complete protection at all times and under all conditions.

The Rails Company, 178 Goffe St., New Haven 11, Conn.

ST. LOUIS, MO. HOBOKEN, N. J. CHICAGO, ILL.



Keeping Pace with...
RAILROAD PROGRESS

This Bowser metering system is the grandpappy of today's Bowser Serv-A-Train . . . both shown above. It has been . . . and still is . . . faithfully serving a railroad in Georgia ever since 1900 . . . more than half a century!
Serving American railroads during the greatest developmental era in the history of the world has been a real privilege!

•

Meet us in Booth 92 at the Allied Railway Supply Association Convention—Sherman Hotel, Chicago, September 17-19. THE NEW BOWSER DIESEL FUEL DEHYDRATOR WILL BE DEMONSTRATED THERE FOR THE FIRST TIME! Come in and see how it makes diesel fuel WATER-FREE!

•

BOWSER ESTABLISHED 1885

BOWSER, INC., 1323 CREIGHTON AVENUE, FORT WAYNE 2, INDIANA

LIQUID CONTROL SPECIALISTS SINCE 1885

Mechanical soldiers need good shoes, too!

THESE are days of grave concerns . . . of conservation and mobilization for strengthening the nation's defense—for the survival of our national economy—for the maintenance and expansion of America's vast network of railroads—for the keeping of every home-front machine in condition to stay on the job until its replacement again becomes a normal procedure.

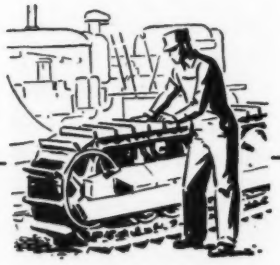
That includes *your* equipment and emphasizes *your* responsibilities. To benefit fully from the productive life that has been built into your "Caterpillar" equipment, you must be alert to its needs as time and hard usage take their toll in wear and depreciation. For instance:

How are your "Caterpillar" track shoes?

Tough as they are, they can't battle rocks, shale, jolts and grinds forever. Growing shortages in the premium steels that go into them may make early replacements difficult—and extra care of track parts something to think about.

CATERPILLAR, PEORIA, ILLINOIS

DO THIS NOW



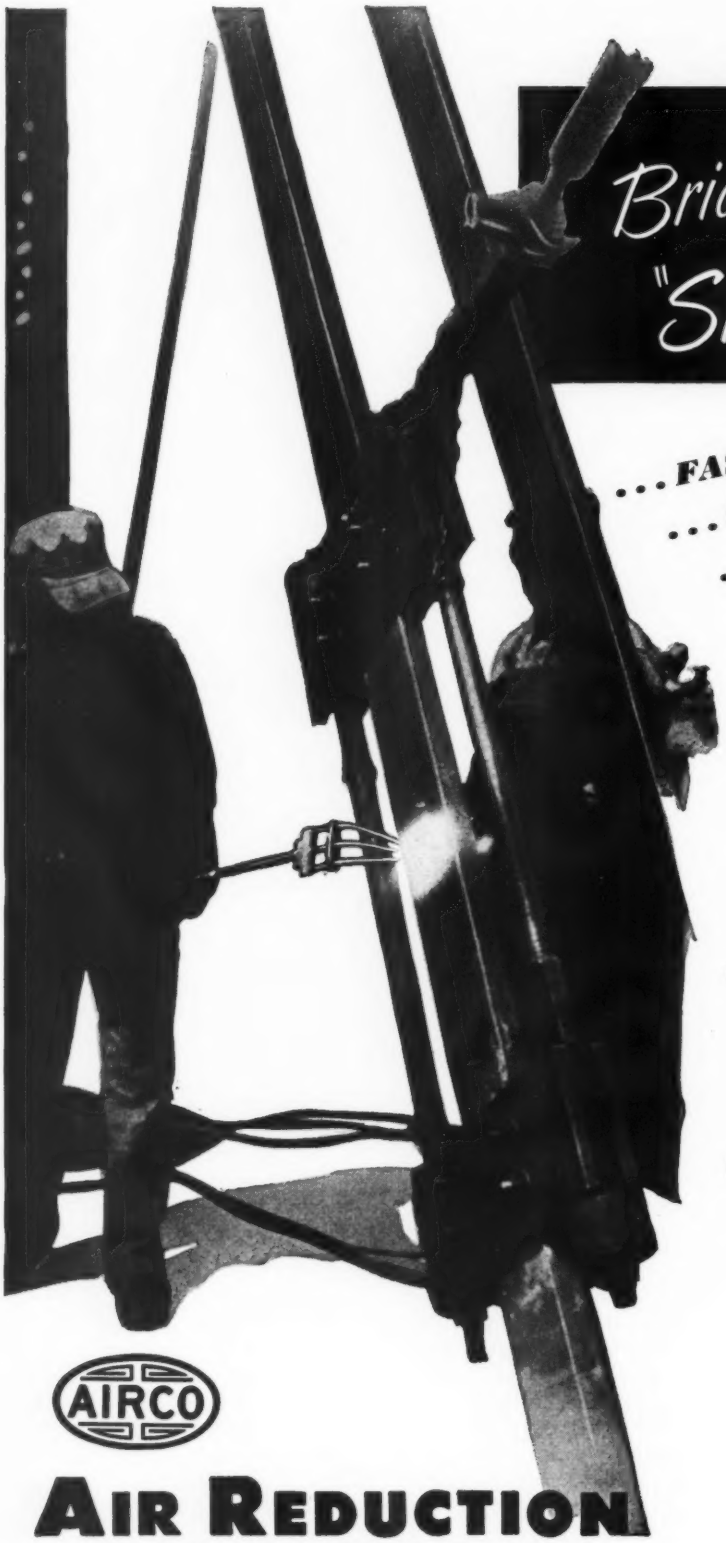
YOU'RE THE DOCTOR. Check those sprockets, grousers, rollers, idlers, pins, links and bushings. Proper track adjustment minimizes wear. Sprockets may need switching from side to side, and pins and bushings need turning, to provide new wearing surfaces. Shoes serve longer if you have worn grousers built up before excessive wear occurs.

Reread your Operator's Instruction Book. Anticipate your future parts requirements. Take the facts to your "Caterpillar" dealer. His modern facilities and skilled servicemen are at your disposal. He can rebuild many parts to keep your machines on the job. Their added life will repay the reconditioning cost over and over.

CATERPILLAR

REG. U. S. PAT. OFF.

DIESEL ENGINES • TRACTORS • MOTOR GRADERS • EARTHMOVING EQUIPMENT



Bridge Braces "SHRINK" fitted

. . . FASTER
. . . CHEAPER
. . . WITHOUT LOSS OF TRAFFIC TIME

Today, many railroads have turned the old process of "flame shortening" into a new time-saving and cost-saving technique for reducing the slack in bridge eye-bar tension members.

Using standard Airco oxyacetylene flame heating equipment, "flame shortening" consists of locally heating the bridge member to be shortened, while applying axial, upsetting pressure to the member by means of a yoke. The yoke is clamped to the member on each side of the spot being heated.

Fast...economical...without any apparent effect upon the fatigue strength or the static strength of the steel, this modern adaptation of an old process can shorten eye-bars as heavy as 10″ x 2″ . . . and, can be carried on between regular scheduled train runs — an important factor to consider when determining work feasibility.

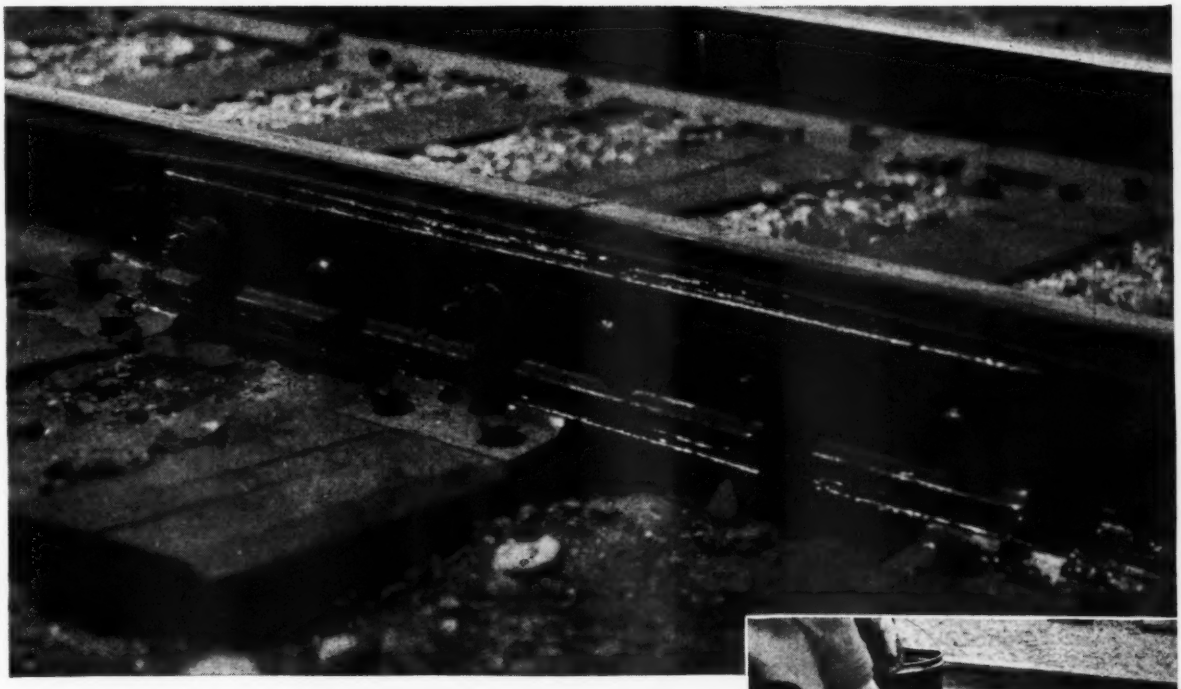
For further information about this unique process, write your nearby Airco office.

Costs come down under the Airco plan

AIRCO

AIR REDUCTION

AIR REDUCTION SALES COMPANY • AIR REDUCTION MAGNOLIA COMPANY
AIR REDUCTION PACIFIC COMPANY
REPRESENTED INTERNATIONALLY BY AIRCO COMPANY INTERNATIONAL
Divisions of Air Reduction Company, Incorporated
Offices in Principal Cities



how to protect rail joints with NO-OX-ID

NO-OX-ID "A Special" gives long-term protection against corrosion when applied on new rails and where joint bars are changed out. Properly applied, NO-OX-ID "A Special" non-drying coating will prevent freezing of the rail joint. Adds years to normal service life at a lower maintenance cost.

The outstanding weathering qualities of NO-OX-ID, its resistance to moisture penetration, and ease of application make it "standard" with maintenance of way men on many leading railroads.

We will gladly tell you more about NO-OX-ID "A Special," the efficient coating that stops rust. The coupon is for your convenience.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

Easy, Inexpensive to Apply

1. Using a wooden-backed wire brush in each hand, workman removes loose scale on both sides of the rail in one operation.
2. A sufficient quantity of NO-OX-ID is placed on each side of rail, using a dipper or ladle.
3. The NO-OX-ID is then brushed on the rail ends with a two-knot roofing brush.

This application method assures good bond of NO-OX-ID on the rail.

Write for complete instructions on how to apply NO-OX-ID "A Special"

Dearborn Chemical Company
Merchandise Mart Plaza, Dept. RE
Chicago 54, Illinois

Please send me bulletin on "How to Protect Rail Joints Using NO-OX-ID."

Name.....

Company.....

Address.....

City.....*Zone*....*State*.....

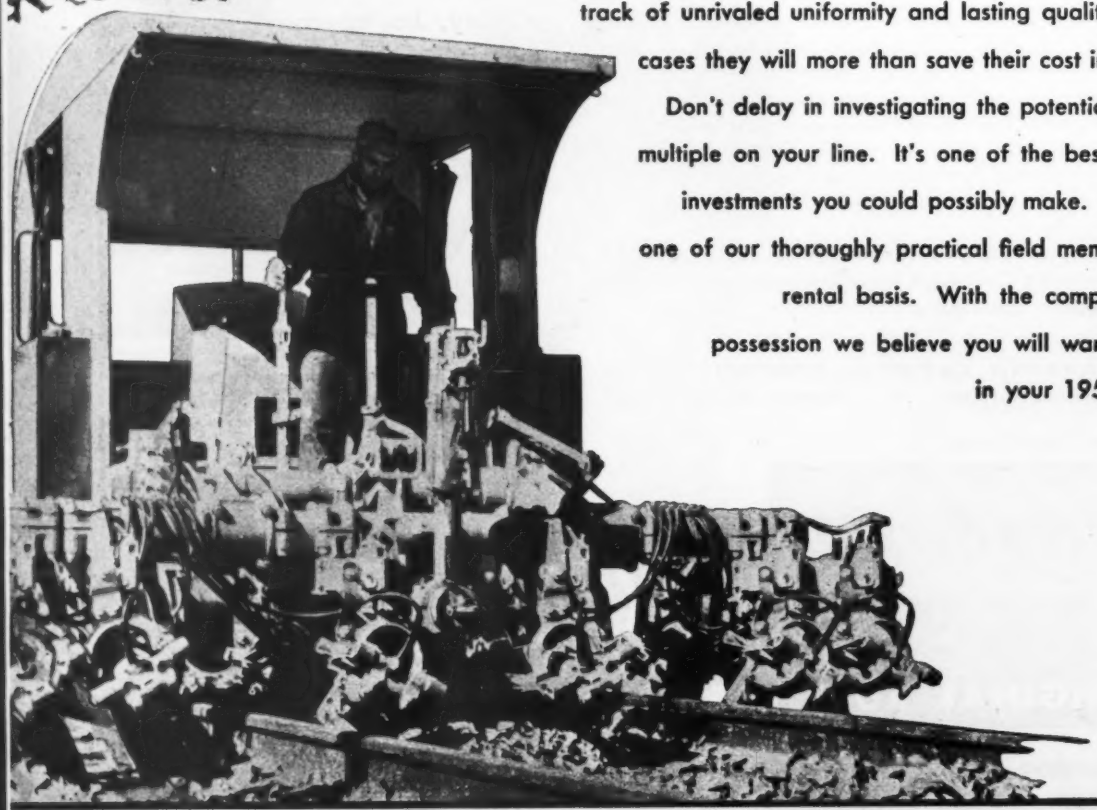
Dearborn
Reg. U. S. Pat. Off.

NO – OX – ID
IRON + = RUST

THE ORIGINAL RUST PREVENTIVE

OVER 50 LEADING RAILROADS and CONTRACTORS NOW USE JACKSON MULTIPLE TIE-TAMPERS!

. . . . and each and every one is solidly sold on these facts: They offer the greatest possible opportunity for saving time, money and labor on all major ballasting operations; they put up track of unrivaled uniformity and lasting qualities. And in most cases they will more than save their cost in a single season. Don't delay in investigating the potentials of the Jackson multiple on your line. It's one of the best dividend-paying investments you could possibly make. Discuss them with one of our thoroughly practical field men, or try one on a rental basis. With the complete facts in your possession we believe you will want to include them in your 1952 appropriations.



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IT HAS THE HIGHEST

REACTION OF ANY

TRACK WASHER IN

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equally important,

IT PROVIDES *Equal Tension*

The world's Finest Spring Washer

VERONA *Fixed* TENSION

TRIFLEX SPRING

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TOOL WORKS

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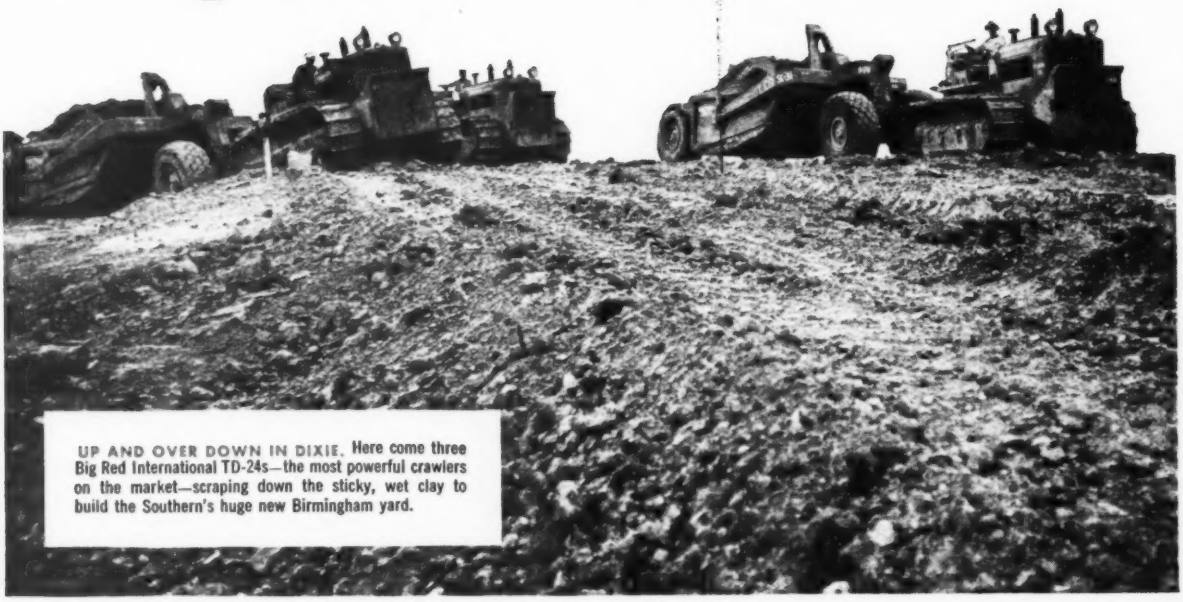
Big Red TD 24

Helps Build Norris Yards



UP AND OVER DOWN IN DIXIE. Here come three Big Red International TD-24s—the most powerful crawlers on the market—scraping down the sticky, wet clay to build the Southern's huge new Birmingham yard.

Three big International Champs grade new $1,700,000 yard in Birmingham, Alabama, for the Southern Railroad

Down in Birmingham, Alabama, the Southern Railroad's new Ernest Norris Yard is taking shape fast. Three Big Red International TD-24s are moving 4,000 cubic yards a day—on an average 2,000-foot cycle in heavy, wet clay—stepping out to help finish the 1,500,000 cubic-yard job on schedule in spite of bad weather.

Superintendent Akin, of the MacDougald Construction Co., gives the straight story: "These TD-24 crawlers are loaded with power. But we think the prime point is the high speed of a TD-24 even with a heavy load!"

It's the stand-out Champ for sure, with 148 drawbar horsepower, eight speeds forward, eight reverse . . . with synchro-mesh transmission . . . and high-low shift without declutching.

Get the real low-down from your International Industrial Distributor. You'll be a TD-24 man from then on in!

INTERNATIONAL HARVESTER COMPANY, CHICAGO 1, ILL.

INTERNATIONAL HARVESTER

POWER THAT PAYS

Over

250,000

FREIGHT CARS

ENTERPRISE

Door Operating Devices

Exclusively Since 1903

ENTERPRISE RAILWAY EQUIPMENT COMPANY

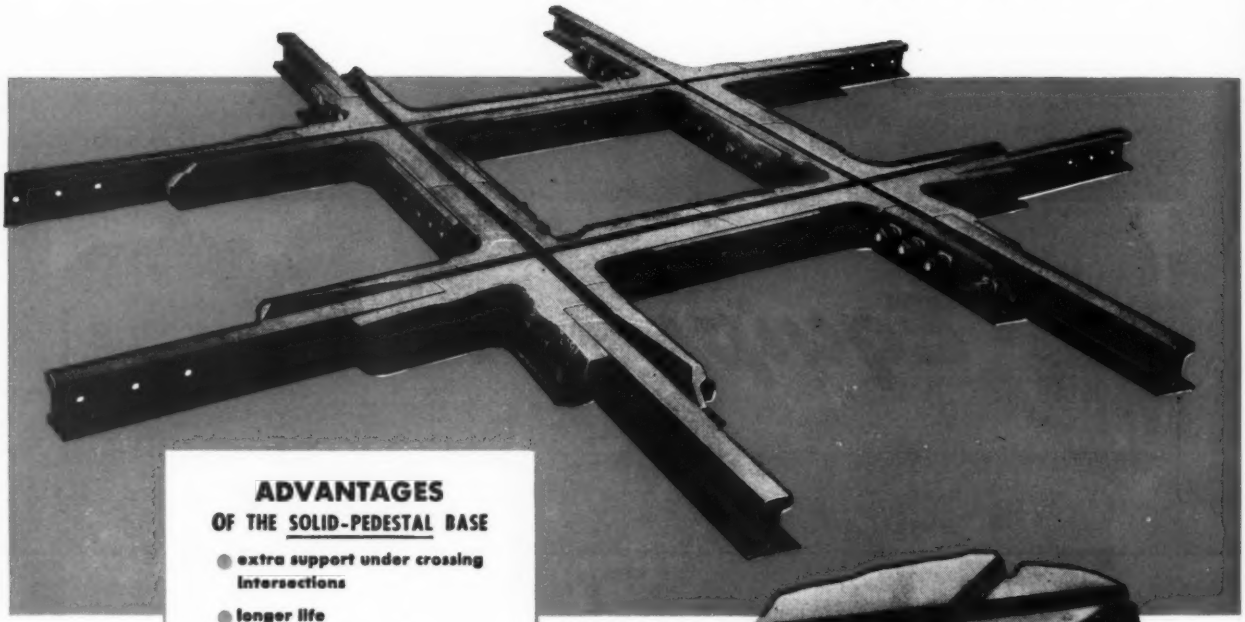
69 East Van Buren Street Chicago 5, Illinois

The most important crossing improvement in recent years...

Solid-pedestal base ***plus***

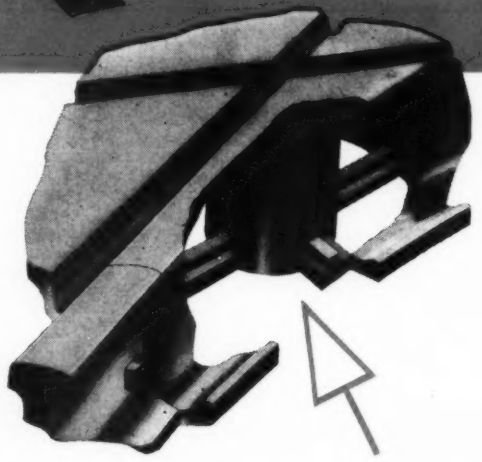
U·S·S MANGANESE STEEL

more durable, lower in



ADVANTAGES
OF THE SOLID-PEDESTAL BASE

- extra support under crossing intersections
- longer life
- improved physical properties
- sounder metal

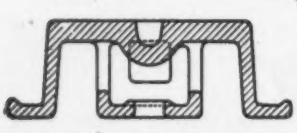


Compare these diagrams

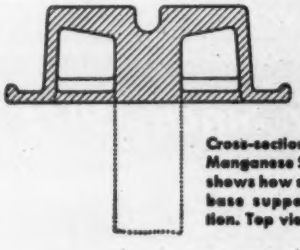
They show clearly why the U·S·S Manganese Steel Railroad Crossing is stronger and more durable.

Below the track intersection, where wheel impact is most severe, the ordinary crossing is hollow (below, left). In the U·S·S Crossing this part is of solid metal giving firm and additional support where it is needed most (center and right, below). It's easy to see why this construction lasts longer.

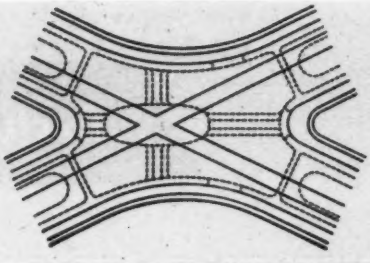
The dotted line in the center diagram indicates the approximate size of the reservoir necessary to handle the extra feed-metal used in casting a new U·S·S Manganese Steel Railroad Crossing. This reservoir (or riser), weighing from 200 to 350 lbs. is cut off and scrapped after the casting has solidified.



Cross-section of old-style manganese steel crossing. Note numerous ribs required to brace the intersection.



Cross-section of new U·S·S Manganese Steel Crossing shows how solid-pedestal base supports intersection. Top view at right.



For additional information, use postcard, pages 783-784

depth-hardened corners ***make***

RAILROAD CROSSINGS

maintenance, smoother riding

A solid pillar of tough manganese steel directly under all crossing intersections is the exclusive feature that distinguishes this newly developed crossing. Here, where maximum strength is required to resist the destructive pounding of today's faster, heavier trains, the U·S·S Manganese Steel Railroad Crossing is extra strong.

The solid-pedestal base, an integral part of the casting, substantially reduces deflections resulting from wheel batter, a major cause of internal cracks that ultimately lead to complete deterioration of crossings. This vertical pillar of solid metal, rigidly reinforced, is far stronger than any other type of intersection support used today.

Metallurgical advances have improved new U·S·S Manganese Steel Railroad Crossings in still another way. By using more feed-metal (5 to 10 times more than is used in ordinary crossings) and exercising closer control over feeding, liquid metal under greater pressure flows unrestricted at the proper time to the solidifying area, preventing the formation of many of the pores and cavities characteristic of manganese castings.

Thus, in addition to the extra vertical support provided by the solid-pedestal base, the entire casting is sounder, freer of internal flaws, and less susceptible to spalling, chipping or cracking.

ADVANTAGES OF THE DEPTH-HARDENED CORNERS

- pounding-down of corners virtually eliminated
- maintenance costs greatly reduced
- much longer life due to higher impact resistance
- smooth riding without rebuilding

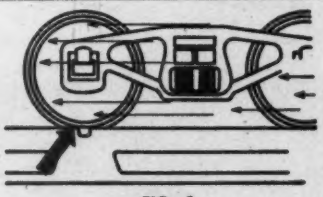


FIG. 1

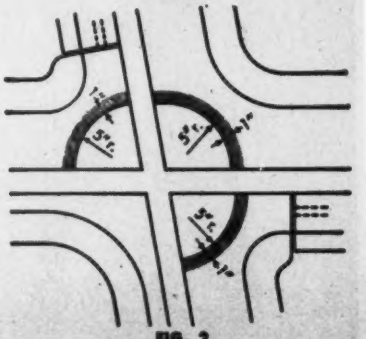


FIG. 2

FIG. 3

Depth-hardened corners reduce maintenance costs, assure smooth riding right from the start

Depth-hardening is another valuable, money-saving feature of the U·S·S Manganese Steel Railroad Crossing.

The ordinary manganese steel crossing is produced to a surface hardness of approximately 200 Brinell. The wheel batter of the first long train is depended on to work-harden the surface to approximately 400 Brinell—the hardness required to stand up under modern rail traffic. Though crudely effective, this wheel pounding also batters down the intersection corners—makes it necessary to build them back to normal track level repeatedly by welding and grinding. This costs money.

In contrast, the improved U·S·S Railroad Crossing has raised pads cast integrally on the three critical crossing corners of each intersection. These are shop-hammered to develop the desired hardness, and then ground down to track level to assure smooth riding. This controlled pre-hammering insures the proper depth hardness *before* installation, eliminates almost entirely the damaging effect of subsequent wheel batter, and virtually eliminates maintenance costs.

Here's why pre-hammered, depth-hardening reduces crossing maintenance

Wheel pounding is the only way the ordinary manganese steel crossing gets sufficient hardness. (Fig. 1) The first long train that batters across the intersection crudely work-hardens the steel to approximately 400 Brinell. But it also batters down the corners about ¼". It takes expensive welding and grinding to rebuild the corners back up to track level.

We avoid this trouble by casting the U·S·S Manganese Steel Crossing with 5/16"-high pads on the three critical corners (see Figs. 2 and 3). These pads are carefully shop-hammered close to track level to develop approximately 400 Brinell hardness, and are then ground to true level *prior* to installation. It saves time and money, gives you a smooth-riding crossing without rebuilding.

For the complete story on this crossing, send for descriptive literature. Coupon is attached for your convenience.

United States Steel Company
Room 4274, 525 William Penn Place
Pittsburgh 30, Pa.

Please send me a copy of bulletin "Improved U·S·S Manganese Steel Railroad Crossings."

Name.....

Company.....

Address.....

City.....Zone.....State.....

1-912

UNITED STATES STEEL COMPANY, PITTSBURGH · COLUMBIA STEEL COMPANY, SAN FRANCISCO
TENNESSEE COAL, IRON & RAILROAD COMPANY, BIRMINGHAM
UNITED STATES STEEL EXPORT COMPANY, NEW YORK

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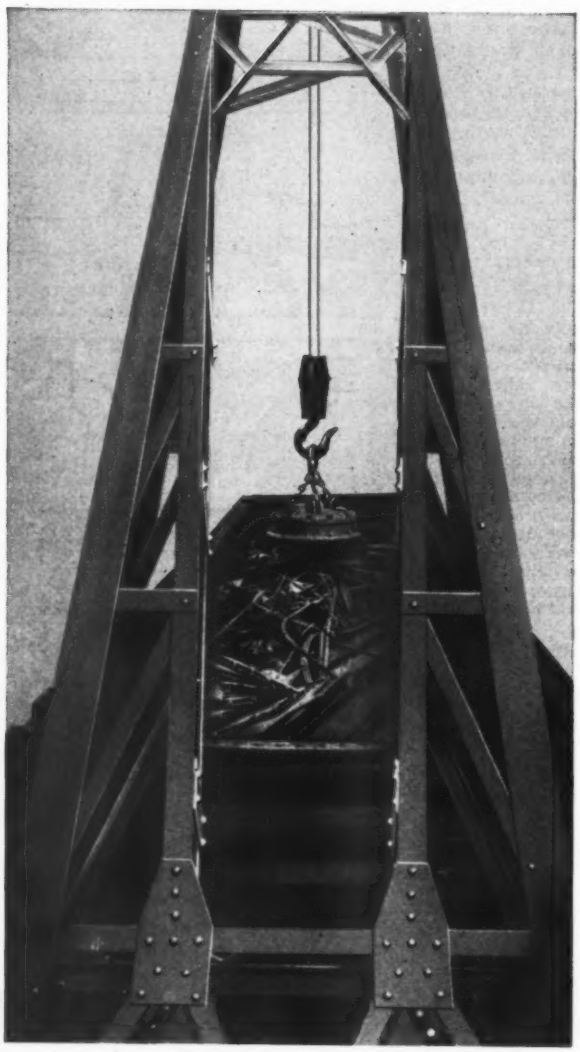
UNITED STATES STEEL

BROWNHOIST – THE ONLY LOCOMOTIVE-CRANE CAB THAT PROVIDES A CLEAR VIEW IN EVERY DIRECTION

Approximate visibility from ordinary cab. *Approximate visibility with operator on side.* *360 degree visibility from new Industrial Brownhoist Monitor-Type Cab.*



Mounted high in the crane and surrounded by large windows, the operator in a Brownhoist patented Monitor-Type cab has full 360° visibility—forward, backward, and to both sides—providing safer operation, faster, more efficient loading and unloading. In addition the new Clear-Vision Boom is another Brownhoist feature that permits the operator an unobstructed view of his work. When unloading from high-walled railroad cars he can see right into the car.

The Monitor-Type cab is also designed for the safety and comfort of the operator. All controls are conveniently located and can be easily reached from a comfortable, well-raised seat. There's a soundproof partition between the operator and the machinery. There are doors on both sides of the cab and there's a 14″ safety clearance between car body and rotating upperworks.

Brownhoist Diesel and Diesel Electric Locomotive-Cranes are available in capacities from 20 tons up for speeding materials handling with magnet, hook or bucket. Write today for complete information.

BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montre··l, Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles. 148

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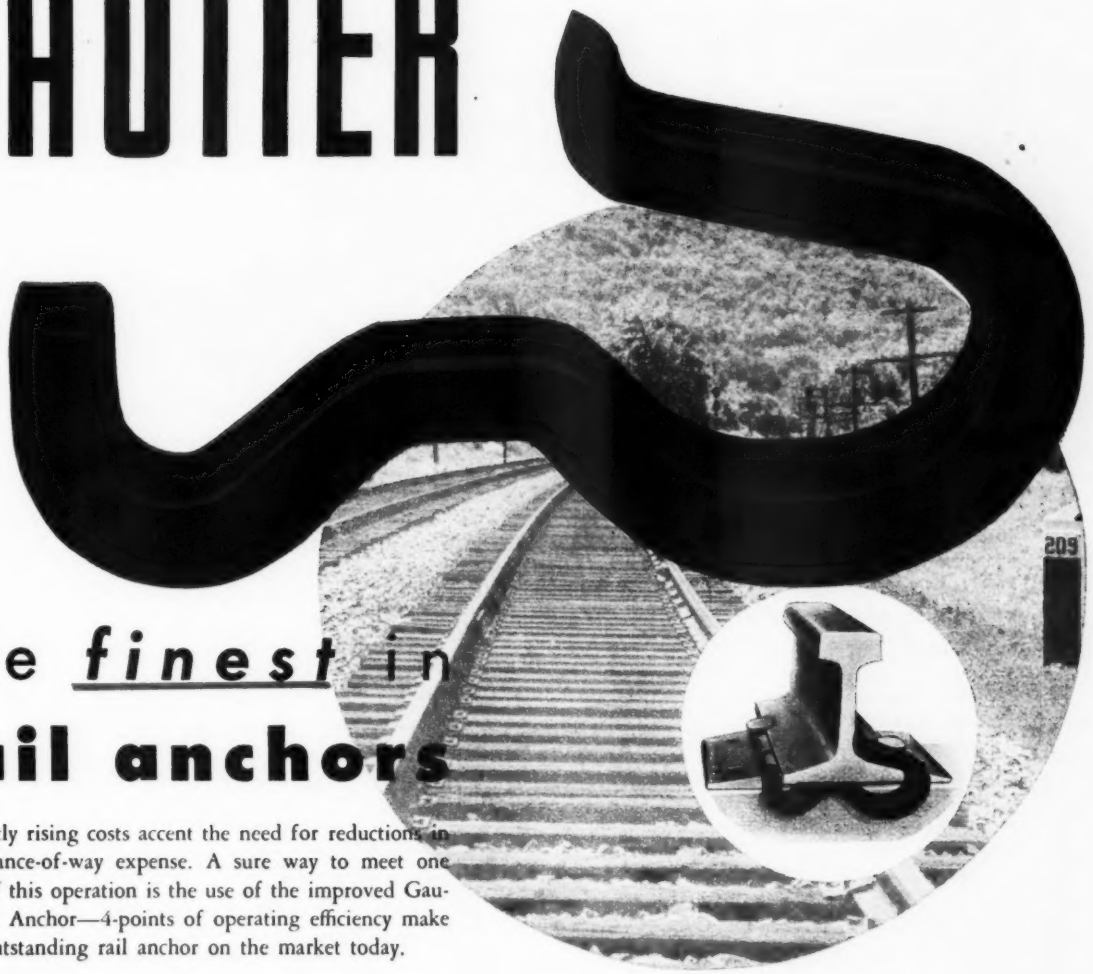
the *improved*

GAUTIER



the *finest* in rail anchors

Constantly rising costs accent the need for reductions in maintenance-of-way expense. A sure way to meet one phase of this operation is the use of the improved Gautier Rail Anchor—4-points of operating efficiency make it the outstanding rail anchor on the market today.

Saves Labor: The improved Gautier is a one-piece anchor that can be applied quickly with a maul or spike maul.

Can't Be Overdriven:

Low Maintenance Cost: Alloy spring steel plus scientific design assure long, trouble-free service.

For New or Old Rail: Substantial take-up and 4-point rail contact make the improved Gautier the most suitable rail anchor for re-application.

Manufactured and sold exclusively by

MID-WEST FORGING & MANUFACTURING COMPANY

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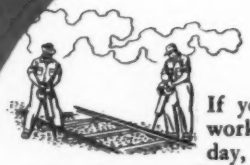
YOUR **EXTRA EMPLOYEE** THAT WORKS WITHOUT PAY

RACINE *Unit* TIE TAMPER



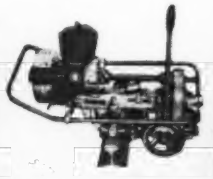
If you had an extra man working eight hours per day, you'd notice the increase in tamped track. A Racine Unit Tie Tamper provides that increase — GIVING YOU THE EQUIVALENT OF EIGHT HOURS MORE WORK EVERY DAY.

Racine Unit Tie Tampers speed up your work and increase manpower efficiency by reducing fatigue. Easily carried, easily operated, shock-free — they team up productively with your operators.

You get longer tool life with less machine maintenance, more uniformly compacted ballast that remains properly placed longer. All these are extras that make the Racine Unit Tie Tamper a valuable employee to serve you capably for a long, long time. Write for free 3-color catalog.

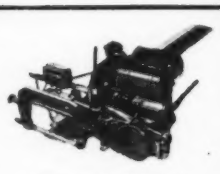
- LIGHT IN WEIGHT (60 lbs.)
- SHOCK-FREE OPERATION
- 1500 BLOWS PER MINUTE
- EASY STARTING MAGNETO IGNITION
- BALANCED RECOIL—SMOOTH ACTION
- LOW MAINTENANCE COST
- 80% IMPROVEMENT IN TOOL LIFE
- LONG TROUBLE-FREE LIFE

OTHER PORTABLE MACHINES BY RACINE



Racine Bond Drill

Racine Rail Drill



Racine Rail Cutter

RACINE

TOOL AND MACHINE COMPANY

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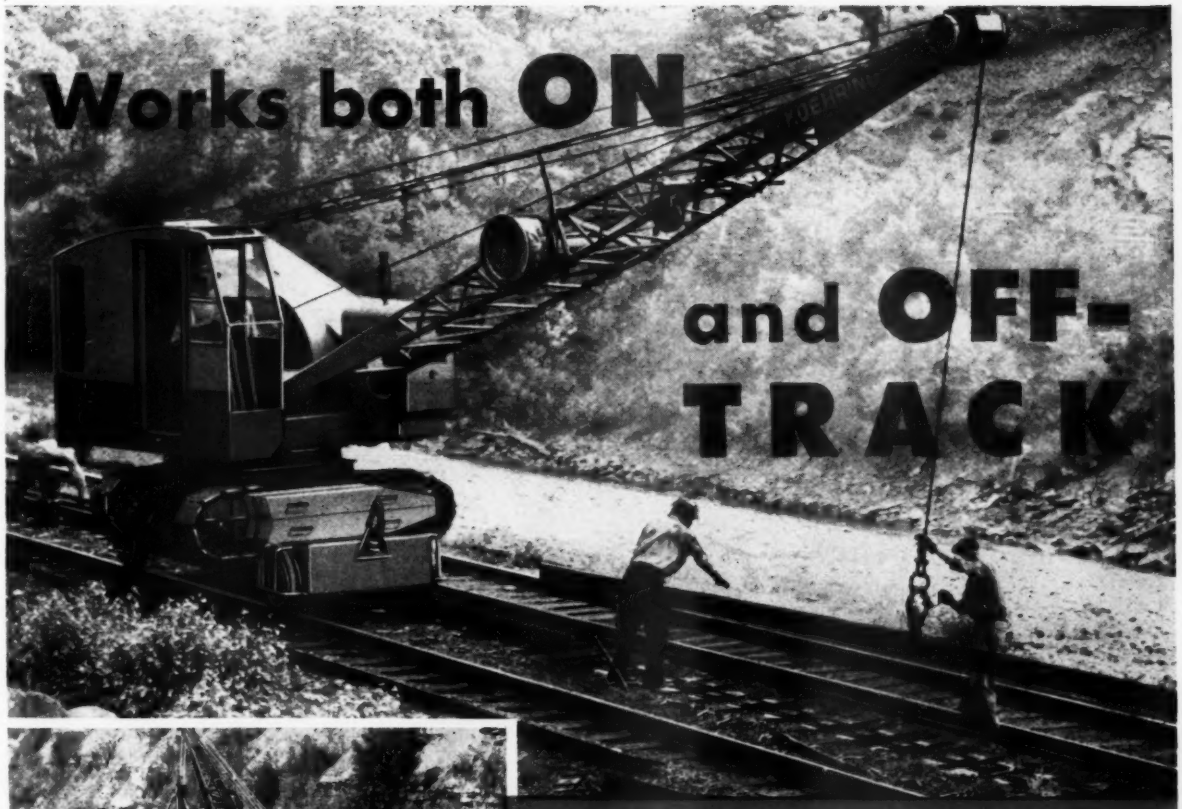

3 LARGER SIZE Koehring excavators have dipper capacities up to 2½ yards . . . lift capacities up to 79½ tons. Heavy-duty ¾-yard 304 (above) safely lifts from 13.9 to 25 tons, depending on crawler, rubber-tired cruiser or truck-type mounting.

SIMPLIFY TRACK-BED STABILIZATION —

Water or ballast pockets in track sub-grade are easily corrected with Koehring Mud-Jack®. Injection points are driven below ballast . . . hydraulic pump forces soil-cement slurry into weakened area, stabilizes existing support material, leaves firm, lasting sub-grade. Slurry can be forced over 70 feet deep for stabilizing fills at trestle ends. There's no interference with rail traffic. You save on labor, cut maintenance costs, reduce "slow orders".

SELF-PROPELLED RAILAID

- Saves extra cost of separate on and off-track cranes . . . combines all the advantages of a self-propelled track crane with the versatility of a standard crawler crane.
- Powers its own rail-propulsion car.
- Travels at 4 rail speeds up to 14.4 m.p.h.
- Loads or unloads itself on ramp-equipped propulsion car in less than 10 minutes . . . sets the carrier on and off track.
- Crane lifts 6.6 tons from carrier . . . has 8¼-ton lift capacity on ground. Standard 30-foot boom extends to 50 feet.
- Readily converts to magnet crane, clamshell, dragline, pile driver, ½-yd. shovel or hoe.
- Get the complete RAILAID story from your Koehring distributor, or send for bulletin.

KOEHRING COMPANY
Milwaukee 14, Wisconsin

Who can show you how to handle ties for 30% less?

THIS man can. He's Bill Blake. He puts his shoulder to the job of helping railroads cut the cost of packaging, handling and distributing railroad ties. Bill represents Brainard's new system of tie distribution—the result of hard hours, weeks and months of research, tests, experiments. But the system is working—so very successfully that costs can be lowered as much as 30 per cent. The Brainard system uses two slack bands of special-made, heavy duty strapping applied at the tie-treating plant. This permits loading and unloading in large units or individually. Bill Blake has actual user's experience he will be glad to go over with you. You'll see how the Brainard system works for others; how it can whittle down the cost and time spent handling and distributing your ties. Bill Blake and our staff engineers are at your service.

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Brainard

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STEEL COMPANY

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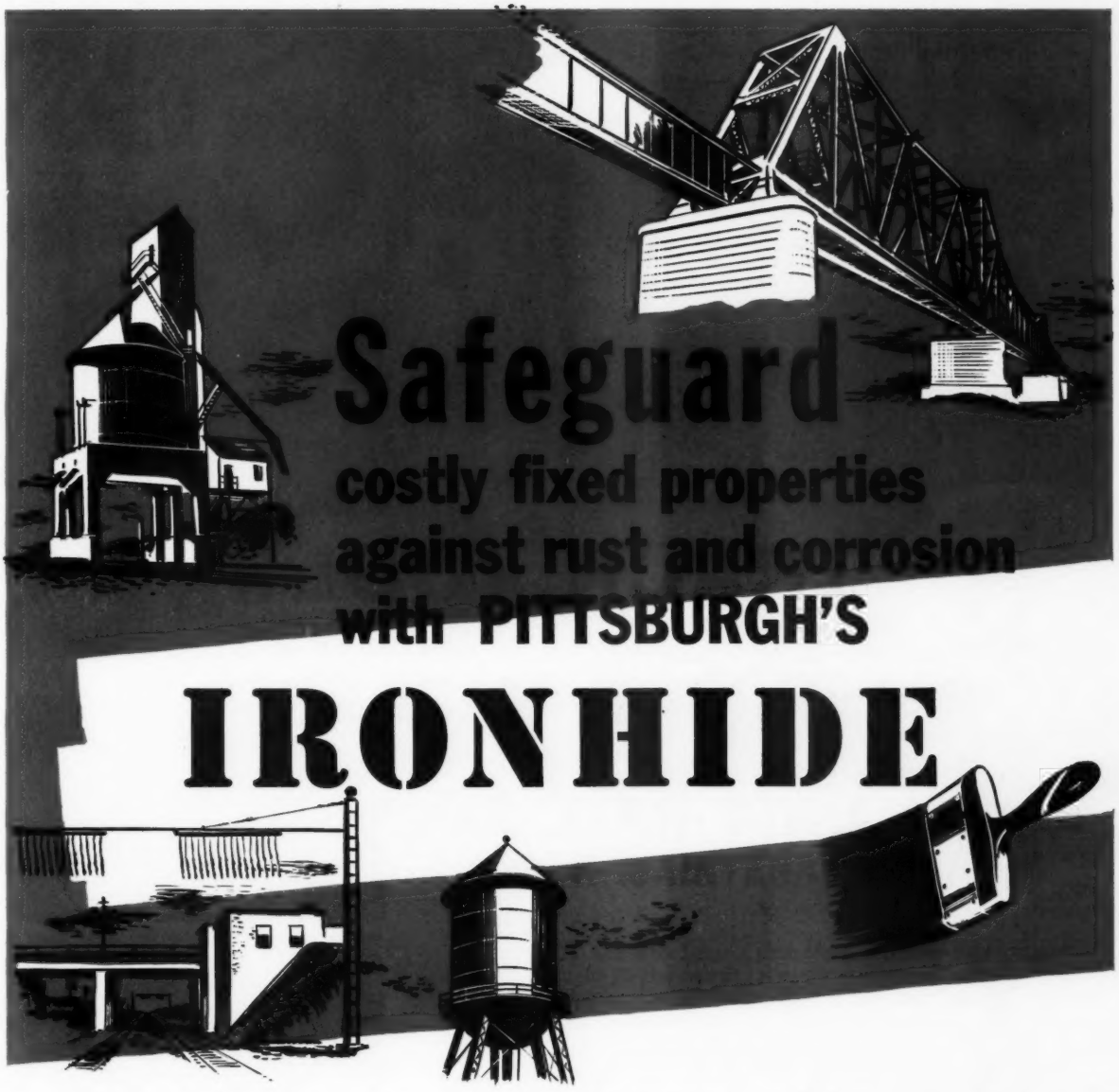

Safeguard

costly fixed properties against rust and corrosion with PITTSBURGH'S

IRONHIDE

PITTSBURGH'S IRONHIDE is a tough, elastic, long-lasting finish specially formulated for the decoration and preservation of iron and steel structures.

It resists rust and corrosion . . . withstands industrial gases, oil, soot and other destructive agents . . . adheres firmly to metal surfaces during extremes of heat and cold.

IRONHIDE dries for recoating overnight when brushed or in only six to eight hours when sprayed. It is available in Red, Black, Light Gray and Aluminum for use on all metal surfaces.

Other Pittsburgh Industrial Finishes available for maintenance of fixed properties include: STATIONHIDE for interiors and exteriors of buildings; CEMENTHIDE for cement surfaces; SNOLITE for signs, fences, cattle guards and crossing gates; traffic and zone marking paints; and a series of Color Dynamics finishes for use in shops and on machinery.

Write today for Pittsburgh's new booklet which lists its complete line of Railway Structural Maintenance Finishes, contains a helpful array of color chips and offers many practical suggestions for the most efficient and economical use of these fine coatings.

• • •

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HUBBARD

TRACK TOOLS
SPRING WASHERS
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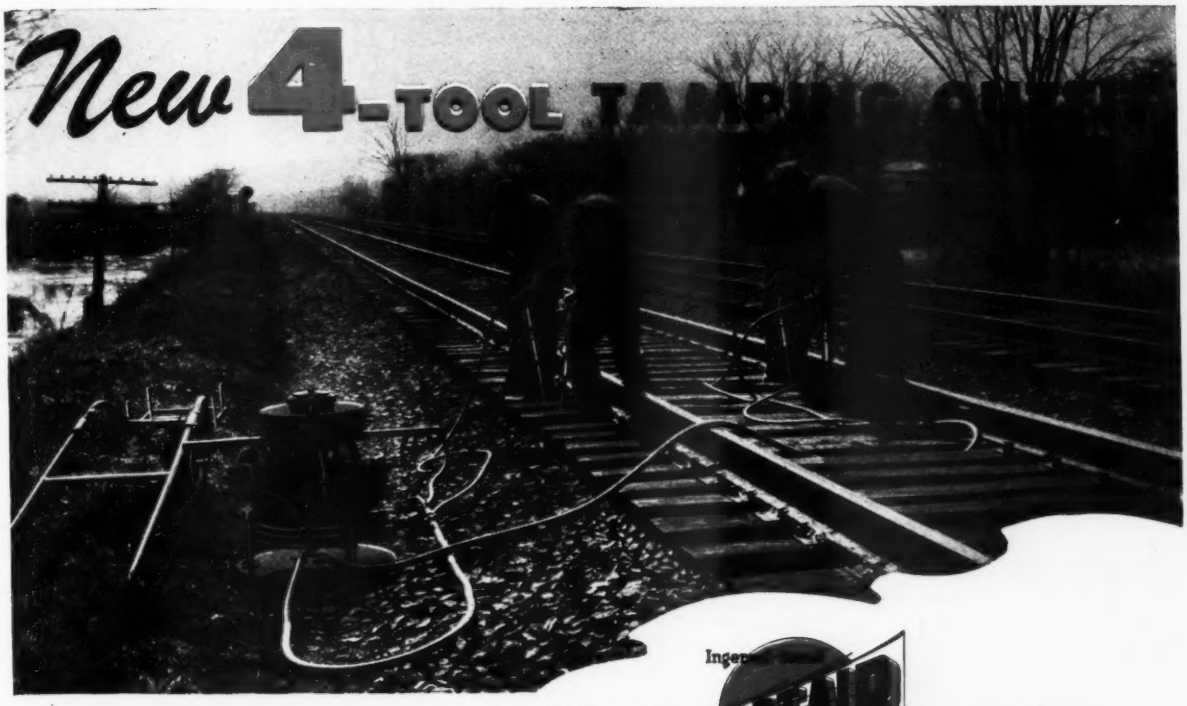
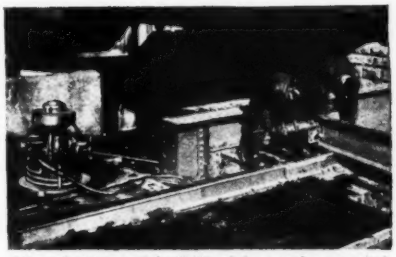
New 4-TOOL TAMPING GANG



36 cfm SPOT-AIR operates four MT-4 Tampers for TRACK MAINTENANCE GANGS



Many bridge and building jobs can be speeded up with the SPOT-AIR and a few air tools.

Rock-breaking and other maintenance of way jobs are easily handled with the SPOT-AIR.

The compactness and lightweight of the SPOT-AIR make jobs in out-of-the-way places easy to get at.

The new SPOT-AIR is the lightest, most compact section-gang compressor of its kind. Its 36-cfm capacity is ample to operate 4 Ingersoll-Rand MT-4 Tie Tampers . . . or a number of other Air Tools used on signal-maintenance, grade-crossing, and numerous emergency jobs.

This 265 pound compressor stands only 32 inches high on a 27-inch baseplate. It is extremely suitable for between-track work under traffic and takes no more space than one man on a section-car.

The self-contained arrangement of three gasoline-engine cylinders and three air cylinders alternately spaced around a vertical crankshaft gives a smooth conversion of engine torque into air power. The 3R-36 is completely air-cooled, thus permitting operation in any kind of weather with no danger of freezing or overheating.

Over 600 smaller-capacity SPOT-AIR compressors, Type 3R-30, have been in successful 2-tamper operation on railroads all over the country during the past two years. The new 3R-36, which delivers full 36 cfm of free air at 80 pounds pressure, has a number of up-to-the-minute improvements which make it the most efficient and easiest to maintain compressor of its type. See your nearest I-R representative for the full story on the SPOT-AIR and Ingersoll-Rand's complete line of Air Power equipment for railway maintenance.

Ingersoll-Rand

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Other IR Air Power equipment for maintenance of way jobs

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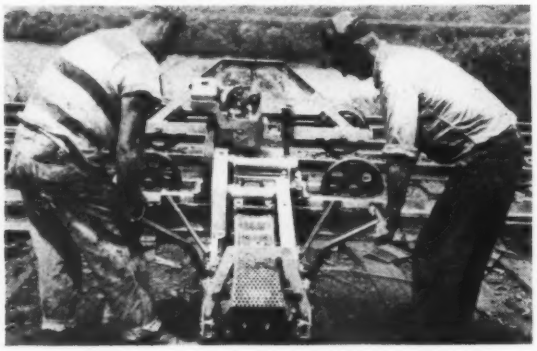
A **BETTER** *way to CLEAN CRIBS . . .*



NEW RTW P-46 BALLAST EXTRUDER

For lowering ballast in cribs before adzing ties, this new RTW machine embodies design and operating features that help speed rail replacement jobs and keep down costs. Rugged teeth mounted on an engine-driven endless chain speedily remove ballast to intertrack spaces or to shoulders without damaging ties. Cribs are cleaned to a uniform level, thus avoiding formation of water pockets.

Simple, compact design makes the RTW P-46 Extruder easy to move along track to and from location. A counterbalancing feature minimizes effort required by operator to raise and lower operating head while machine is in use.

Be sure to call or write immediately for full description and prices on this time- and cost-saving unit.

Railway Trackwork Co.
3207 KENSINGTON AVE., PHILADELPHIA 34, PA.

Distributors for

Burro Cranes
Dapco Sprayers
LeRoi Air Compressors
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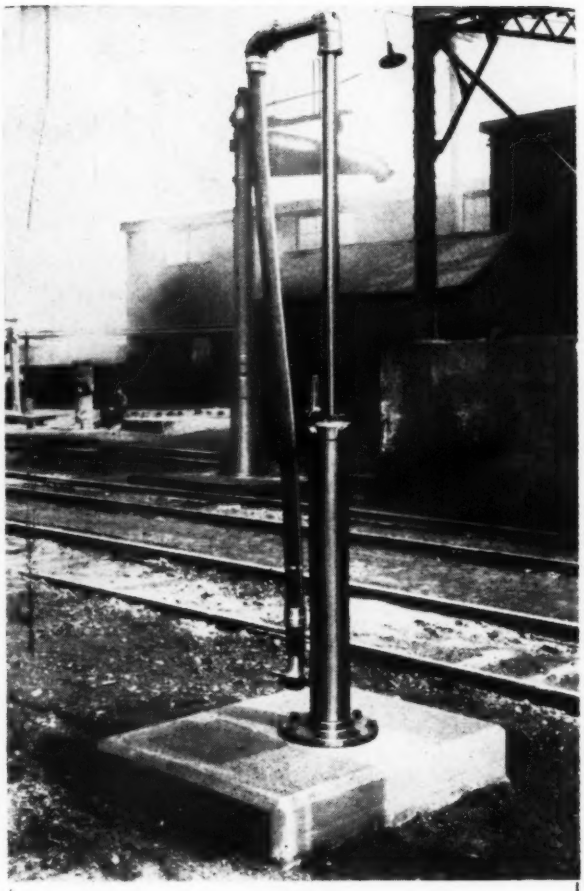


POAGE *Water Columns* for servicing Diesel locomotives

Two outstanding features of the POAGE Diesel Water Columns are:

1. Incorporation of the POAGE Water Hammer Eliminator in the valve chamber; prevents damaging water hammer in the supply line after the valve is shut off.
2. Draining of vertical column after service; eliminates necessity of costly frost boxes around the exposed section of the vertical column to prevent freezing.

POAGE Diesel Water Columns have been operated in sub-zero temperatures with continuous satisfactory performance.

The upper end of the vertical column is equipped with a swivel joint to permit watering of Diesels on parallel tracks. The outer end of the extended arm is also equipped with a swivel joint, so the hose may be pulled to full length without danger of kinks.

We invite your inquiry.

RAILROAD PRODUCTS CO.
2833 Spring Grove Avenue
Cincinnati, Ohio

NOW! when maintenance is more important than ever

Make car lumber LAST!

use Penta*-Protected wood

Heavy traffic does not *have* to mean more maintenance for busy equipment. You can cut maintenance by protecting car lumber, and all lumber, with PENTA . . . and give your wood longer, more dependable life.

PENTA protects wood against termites and decay, gives wood greater serviceability. PENTA-PROTECTED WOOD is clean, easy to handle and can be painted. PENTA is economical, too!

Railroad service records *prove* that treated wood lasts three to four times longer than untreated wood. This means that PENTA-PROTECTED WOOD costs you *less per year!*

USE PENTA-PROTECTED WOOD not only for car lumber but also for poles, loading platforms, all wood buildings and other wood construction. Protect your investment in wood. Make it a *sure* thing . . . with PENTA!

INVESTIGATE Penta THE CLEAN WOOD PRESERVATIVE

*PENTA is a popular abbreviation of the name of the chemical, PENTAchlorophenol.

THE DOW CHEMICAL COMPANY
MIDLAND, MICHIGAN

DOW
Penta
chlorophenol

In Your 1952 Weed Control Program

For Real Results instead of Half-Way Measures

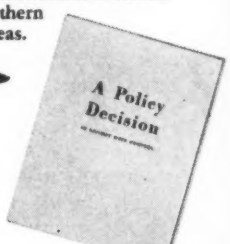
Investigate

GENERAL CHEMICAL WEED CONTROL

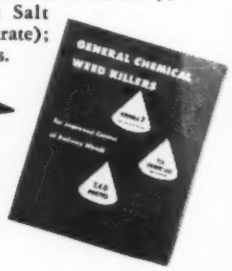
TRADE MARK REG U S PAT OFF

It's tailor-made for all types of vegetation—for all climatic conditions!

Important information available: "A Policy Decision in Railroad Weed Control" . . . outlining General's proven method of treatment. It contains full color illustrations of results achieved in northern and southern areas.



"General Chemical Weed Killers" ...helpful information on General's Weed Killers. These include: Formula 7 (TCA, acid in an oil base); TCA, Sodium Salt (liquid concentrate); 2, 4-D Additives.



Let us tell you how the proven General Chemical Weed Control Program has achieved outstanding results for leading roads.

At your convenience, a conference with a General Chemical Weed Control Specialist may be arranged to discuss your particular problem and its solution. Before we call, let us send you copies of our latest literature. ***Write on business letterhead to***

WEED KILLER DEPARTMENT

GENERAL CHEMICAL DIVISION

ALLIED CHEMICAL & DYE CORPORATION

40 Rector Street, New York 6, N. Y.

ADDITIONAL INFORMATION

On Any of the Products Mentioned in This Issue

Below is a complete index of the products referred to in both the editorial and advertising pages of this issue. If you desire additional information on any of them, use one of the accompanying addressed and stamped postcards in requesting it. In each case give name of product and page number. The information will come to you directly from the manufacturer involved, without any obligation on your part.

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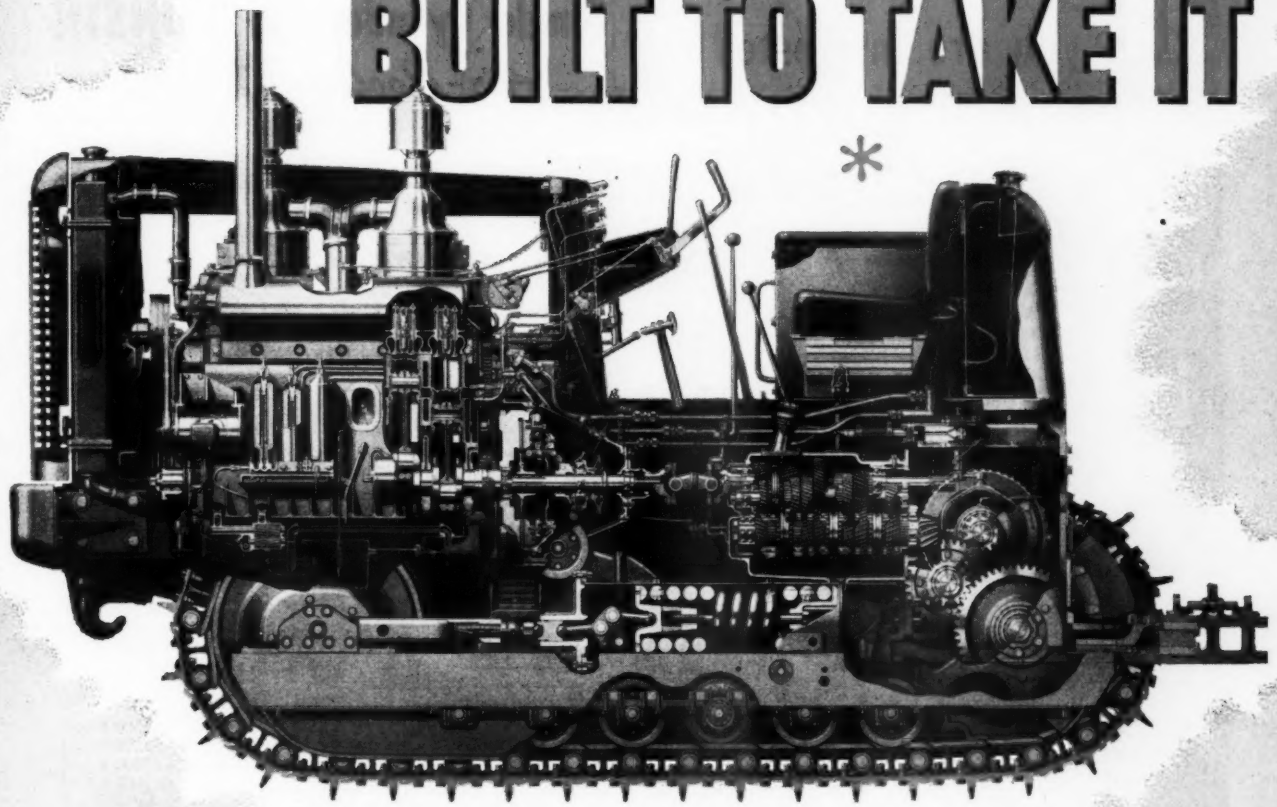
Here's what WE mean by BUILT TO TAKE IT



The new Allis-Chalmers tractors are the toughest, strongest tractors ever built. Every part in each of the four models has ample size and strength to do its job — not a weak link nor a compromise anywhere.

And that's no accident! To bring you tractors like these . . . with the qualities you want . . . Allis-Chalmers built 'em completely new — from the ground up.

You can depend on them to take the loads, the jolts of today's jobs . . . . because they are modern tractors designed for the most grueling operating conditions. They will more than measure up to your expectations!

Here are just a few of the many reasons why this NEWEST, FINEST TRACTOR LINE ON EARTH is *Built To Take It*... besides being easy to operate, easy to service and outstanding in performance. Your Allis-Chalmers dealer will gladly explain all these advantages . . . see him NOW.

- All-Steel Welded Construction
- More Power with Bigger Engines — Longer Engine Life
- More Weight, Greater Strength
- Extra Heavy Main Frames — No Extra Reinforcement Needed for Front-Mounted Equipment
- Long-Lasting, Large Diameter Clutches
- Double Reduction, Straddle-Mounted Final Drive Gears with Live Sprocket Shafts and Caged Bearings
- Positive Operating Track Release — Works in Oil on HD-9, HD-15, HD-20
- All New, Specially Designed Track Assembly
- Positive-Seal Truck Wheels, Support Rollers and Idlers — Mounted on Tapered Roller Bearings. 1,000-Hour Lubrication!

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The Newest, Finest Tractor Line on Earth!

40.26 drawbar hp.
11,250 lb.

70 drawbar hp.
18,800 lb.

102 drawbar hp.
27,850 lb.

Hydraulic Torque Converter Drive
175 net engine hp.
41,000 lb.

- DESIGNED FOR YOUR JOB
- BUILT TO "TAKE IT"
- EASY TO OPERATE
- EASY TO SERVICE

If you are interested in

BALLAST CLEANING

we stand on our record

Just Ask the Railroads That have used us!

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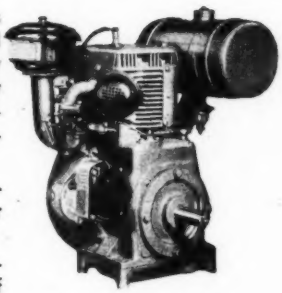
306 North Cayuga Street Ithaca, New York

The POWER ADVANTAGE Story of the Model AEN Single Cylinder WISCONSIN *Air-Cooled* ENGINE

Here's more power . . . less weight . . . lower cost . . . all with no sacrifice in heavy-duty construction and serviceability in this Model AEN single-cylinder Wisconsin Engine. Features include:



Model AEN 4-cycle single cylinder standard engine.

1. Dependable air-cooling under all climatic and weather conditions.

2. Self-cleaning tapered roller bearings at *both* ends of the crankshaft withstand either side-pull or end-thrust without danger to bearings.

3. Rotary type high tension OUTSIDE Magneto with Impulse Coupling operates as an entirely independent unit that can be serviced or replaced in a few minutes.

4. Maximum torque at usable speeds for equipment that really has to go to work.

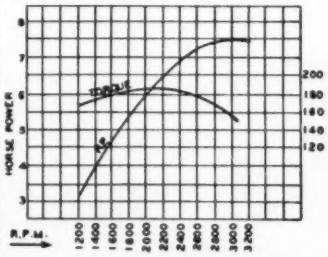
SPECIFICATIONS, MODEL AEN

Bore	3"
Stroke	3¼"
Piston Displacement	23 cu. in.
Horsepower	5.1 H.P. at 1800 R.P.M. 6.4 H.P. at 2200 R.P.M. 7.2 H.P. at 2600 R.P.M. 7.5 H.P. at 3000 R.P.M.

WHEN ORDERING ENGINE SPECIFY SPEED DESIRED

Diameter of Valves	1 5/16" O. D.
Spark Plug size	18 mm. Metric
Fuel Tank Capacity	1.7 Gals.
Valve Location	L-Head
Piston Pin Diameter	¾" Floating Type
Conn. Rod — Steel Forging	Length 8"
Conn. Rod Bearing	1⅛" x 1¼"
Oil required in Reservoir	3 Pts.
Cylinder Head	Aluminum, Removable
Cylinder — Crankcase	Cast Iron
Valve Seat Inserts	Nickel Chrome Molybdenum Iron
Piston	Aluminum Alloy
No. of Piston Rings	4
Main Bearings	Tapered roller of generous size
Crankshaft	Counterbalanced Heat Treated Drop Forging

Weight-Lbs.	Net	Crated
Standard Engine	110 Lbs.	135 Lbs.



POWER CURVE AND HORSEPOWER LISTING SHOWS MAXIMUM DYNAMOMETER HORSEPOWER OF ENGINE complete with fan, muffler and air cleaner. For continuous heavy-duty operation do not rate engine at more than 80% of the horsepower shown at any given speed.

Detailed information gladly supplied on request.

WISCONSIN MOTOR CORPORATION

World's Largest Builders of Heavy-Duty Air-Cooled Engines

MILWAUKEE 46 WISCONSIN

3 Good Questions...

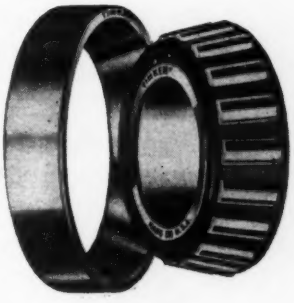
Why do TIMKEN® bearings take heavier loads and have longer life?

Why do TIMKEN bearings resist wear and retain precision longer?

Why are TIMKEN bearings more uniform in their high quality?

One Good Answer—

THE TIMKEN COMPANY MAKES ITS OWN STEEL!



THERE are several good answers to the questions above. But one of the *basic* reasons for the superior load capacity, wear resistance, and uniform high quality of Timken® bearings is the fact that the Timken Company makes its own steel. And the Timken Company is the only bearing manufacturer in America that does!

Having its own steel-making facilities enables the Timken Company to carry on research and development in steels that results in constant improvement in quality. It also permits complete control of the product—from melting through final inspection.

The high quality of Timken steel begins in the melting of selected scrap. Correct chemical composition of every heat is insured by use of the direct-reading spectrometer, new scientific instrument for analyzing a heat of steel in a matter of seconds. Even after the steel is in billet form, quality safeguards continue. The billets are scarfed and chipped to prevent cracks and flaws in the internal structure of the finished product.

Along with advanced design, precision manufacture, and rigid quality control, Timken steel is one of the big reasons why it pays to always look for the trade-mark "Timken" on the tapered roller bearings you buy. The Timken Roller Bearing Company, Canton 6, Ohio. Canadian plant: St. Thomas, Ont. Cable address: "TIMROSCO".

TIMKEN TRADE-MARK REG. U. S. PAT. OFF. **TAPERED ROLLER BEARINGS**

NOT JUST A BALL ○ NOT JUST A ROLLER ⬭ THE TIMKEN TAPERED ROLLER ⬭ BEARING TAKES RADIAL ⓡ AND THRUST ←ⓣ→ LOADS OR ANY COMBINATION ←ⓡⓣ→

GUARD YOUR SWITCH POINTS AND SAVE LABOR OF RENEWALS

Q and C Manganese Switch Point Guards will prolong the life of Switch Points, also stock rails, and will eliminate derailments caused by sharp wheel flanges climbing on worn points.

Order now to insure these savings for your railroad.

Other Q and C Products:

Derails, Guard Rail Clamps, One-Piece Manganese Guard Rails, Step Joints, Wheel Stops, Gauge Rods, Car Replacers, Snow Flangers and Plows, Skid Shoes, Anti-Slip Rail Tongs, Flangeway Brackets, Electric Snow Melters, Gauging Tools, Foot and Heel Guards.

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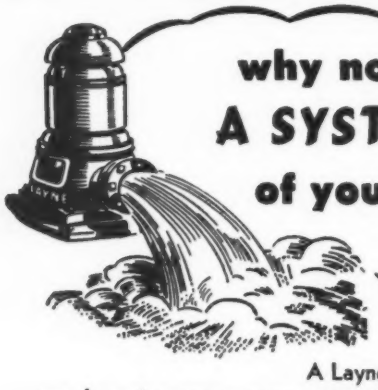

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A Layne built well water supply system on your own property is an excellent investment. First, it greatly increases your water supply at little or no extra cost over what you are now paying. Next, it gives you better protection for your plant, equipment and offices. Once installed, your own system will end worry about water supply failure and relieve you of paying high rates. Send for Layne's newest catalogs on well water systems. No obligation. Address

LAYNE & BOWLER, INC.
General Offices, Memphis 8, Tenn.

Layne WATER SUPPLY WELLS & PUMPS

TUCOLITH for FLOORS

"Why limit a good thing?" say railroad men who have found that Tucolith, so familiar as a floor covering for rolling stock, can give the same dependable service on the floors of all railroad installations. This sturdy composition material combines attractiveness with strength, yet is economical, easy to mix and lay. Use it in stations, offices, towers, restaurants, store rooms — wherever floors must stand up under constant wear. Tucolith on all your floors means safety, service, economy in all your operations.

TUCOLITH IS FIRST FOR FLOORS . . . BECAUSE IT'S —

- ★ Fireproof, waterproof, non-slippery, completely safe.
- ★ Six smart colors — maroon, blue, tan, brown, grey, and black—or two-color floor-and-border combinations.
- ★ Easy to mix and lay (by your own men); easy to maintain.
- ★ Proved in rolling stock.

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TUCO PRODUCTS CORPORATION
30 Church St., New York 7, N. Y.

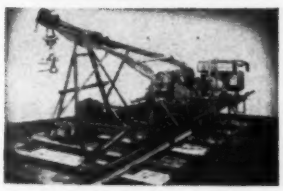
Curve Rail Life
doubled and re-doubled with MECO Curve Rail Lubricators

That's right! You can double and re-double the life of new curve rails—and lengthen the remaining life of present curve rails 2 to 4 times with Meco Curve Rail Lubricators.

And that's not all! Meco Lubricators decrease train resistance, reduce wear on wheel flanges and make higher speeds possible with safety.

Let us inspect your track curve territory and report on the savings you can make with properly located Meco Curve Rail Lubricators.

MECO POWER RAIL LAYER



No Work Train or Train Crew Required.

MACK REVERSIBLE SWITCH POINT PROTECTORS

Prolong switch rail life, 8 to 10 times!

Maintenance Equipment Company
RAILWAY EXCHANGE BUILDING • CHICAGO 4, ILLINOIS

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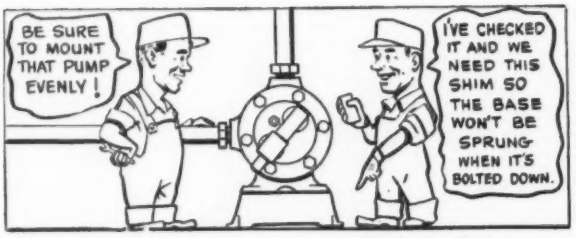

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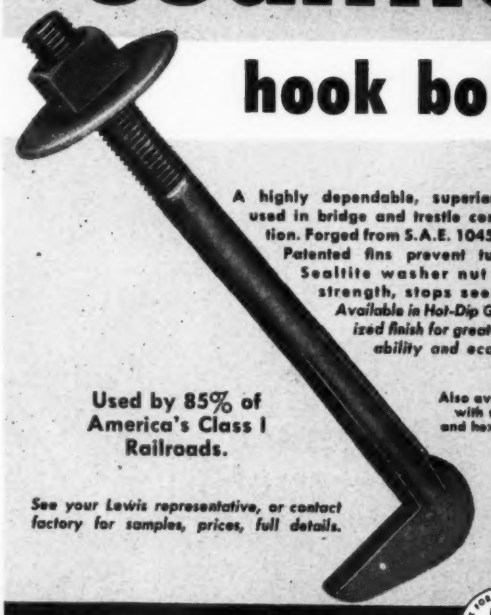

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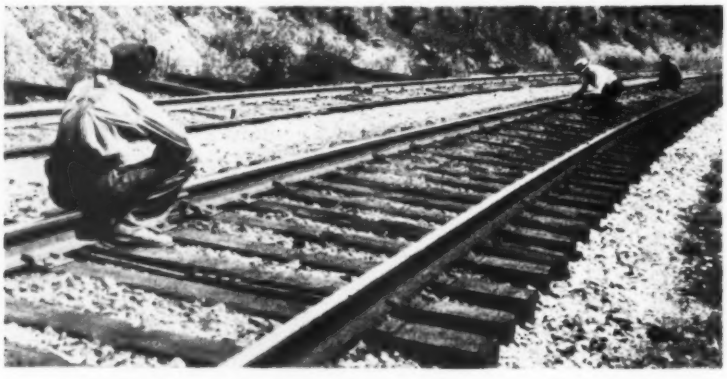

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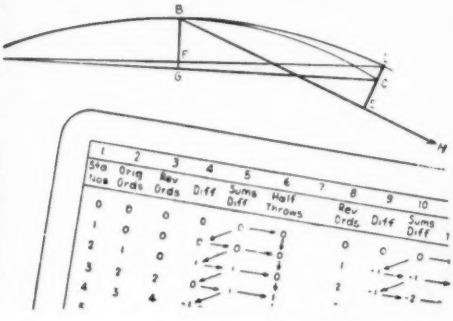

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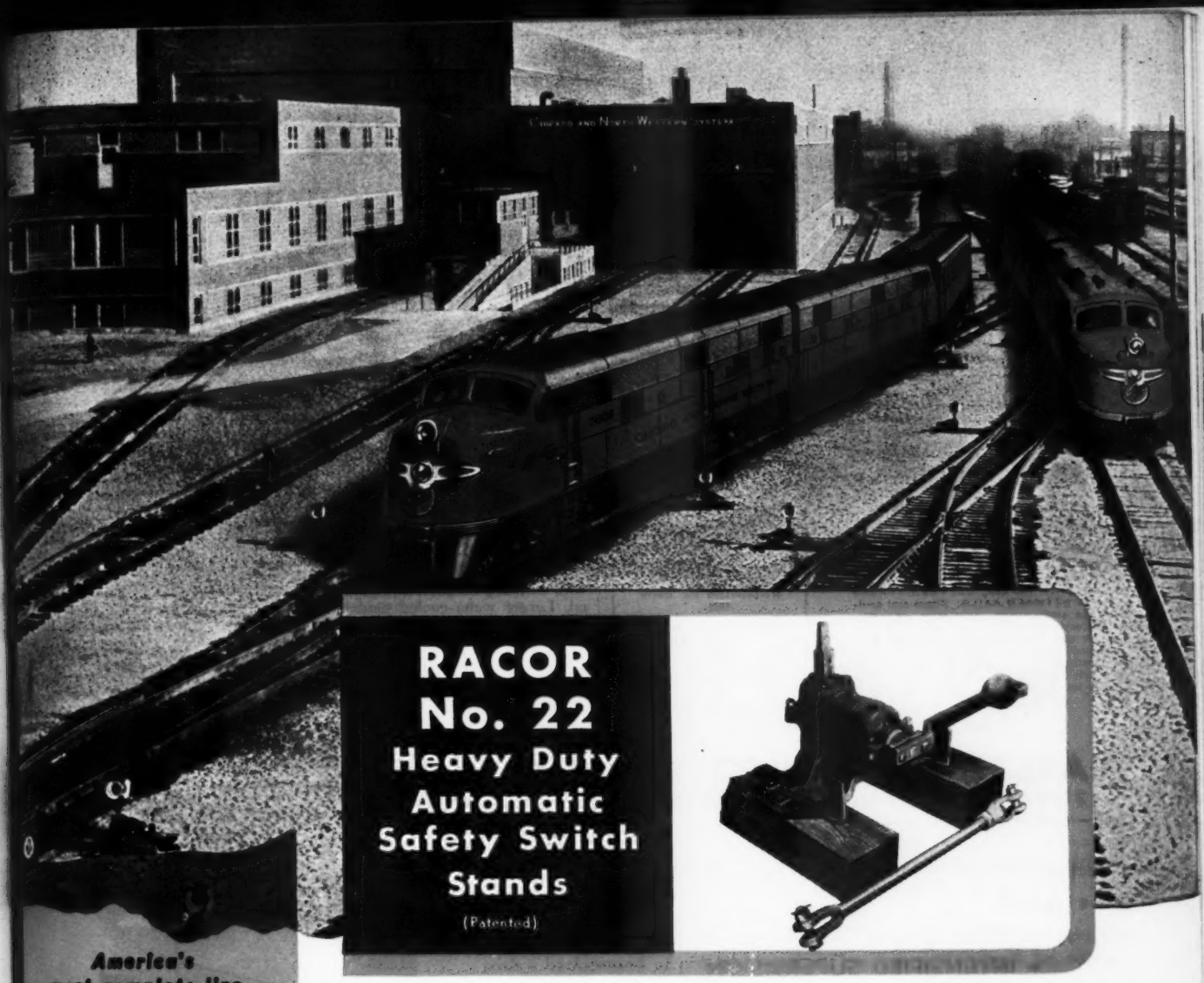

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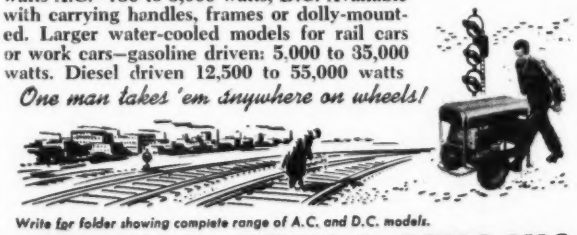

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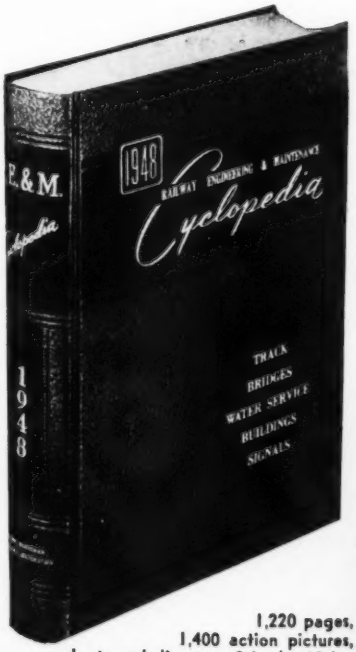

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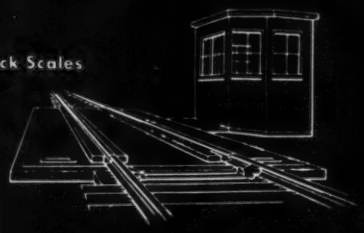
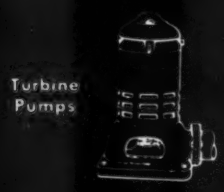


Track Scales



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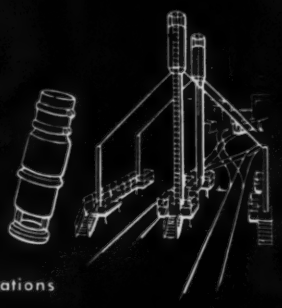

Sanding Stations

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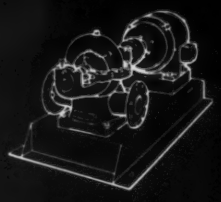

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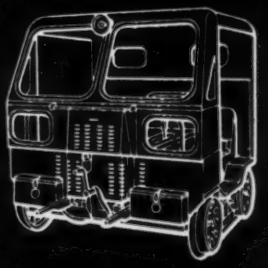
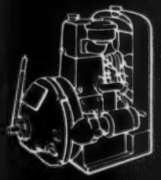


Rail Cars



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No. 273 of a series

Railway Engineering and Maintenance

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Subject: Ingredients of Progress

September 1, 1951

Dear Readers:

Through personal contacts and by correspondence we receive many indications of the degree of reader interest in our publication. These indications may be of a general nature or they may be specific, referring to particular articles or issues. Sometimes they may be obscure in that there is no ready explanation of the reasons for some expression of interest, such as when a telegram is received for an extra copy of some particular issue, or when a call comes into the switchboard (as one did a few moments ago) for several copies of a recent number.

As frequent as these expressions of interest are there is ample reason to believe that they are only a faint reflection of what goes on behind the scenes, that is, without the knowledge of the editors. A couple of examples will explain what I mean. Some time ago we published an article describing a new method of making subsoil surveys, which was being used on a Midwestern road. A short time later the top-ranking maintenance officer on this road told us he had been swamped with inquiries from other railroads, the volume of which was so great that he had found it necessary to prepare a standard reply in mimeographed form. In another instance the author of a contributed article told us he had received a dozen calls about his article within a few days after it had appeared. In neither instance was evidence available in the editorial office to indicate that our readers had found these articles of special interest.

I mention this matter not merely because it brings out an interesting phenomenon, but also because it illustrates two points. One is the intense interest of railroad maintenance men in new developments in their field of activity. The second point brought out is the role that a trade publication plays in opening up lines of communication to its readers. In other words the publication not only provides a fund of information itself but also suggests further lines of inquiry and indicates where additional information may be obtained.

Wherever these two elements exist—the desire for useful information and the means of satisfying that desire—continued progress toward better, more economical ways of doing things is a foregone conclusion.

Yours sincerely,

Merwin H. Dick

MHD:ag

Editor

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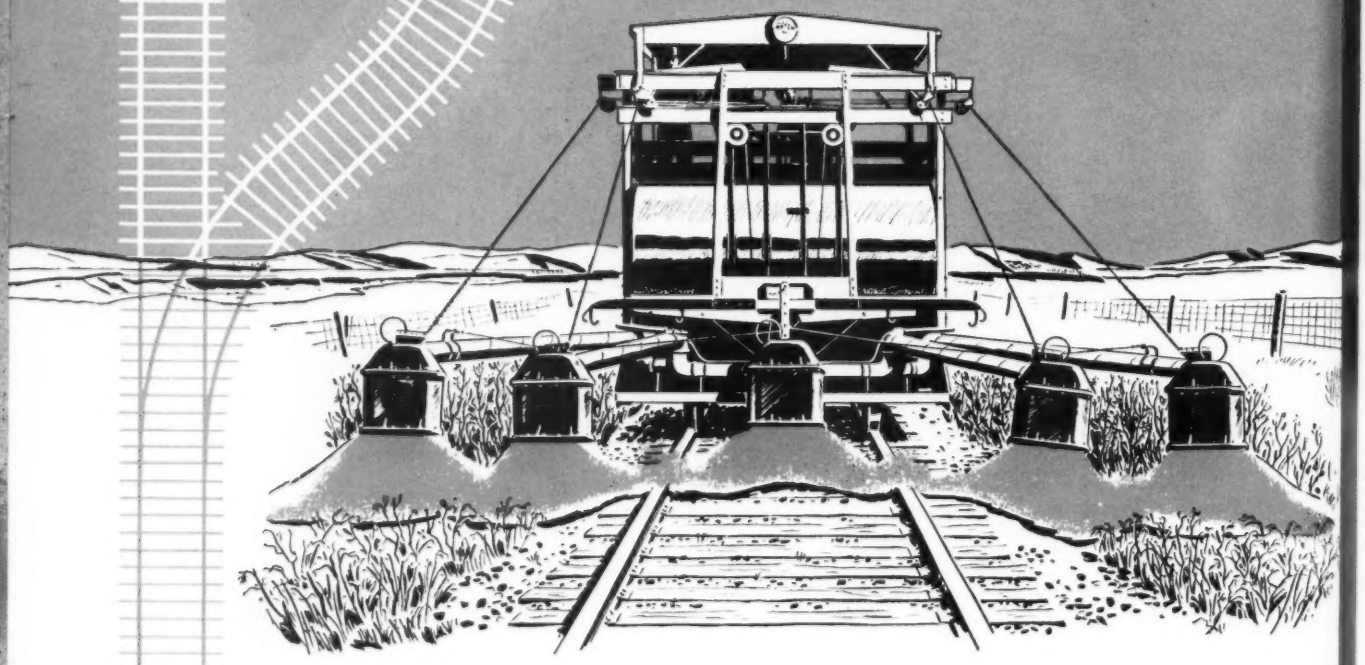

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VOL. 47, NO. 9 SEPTEMBER, 1951

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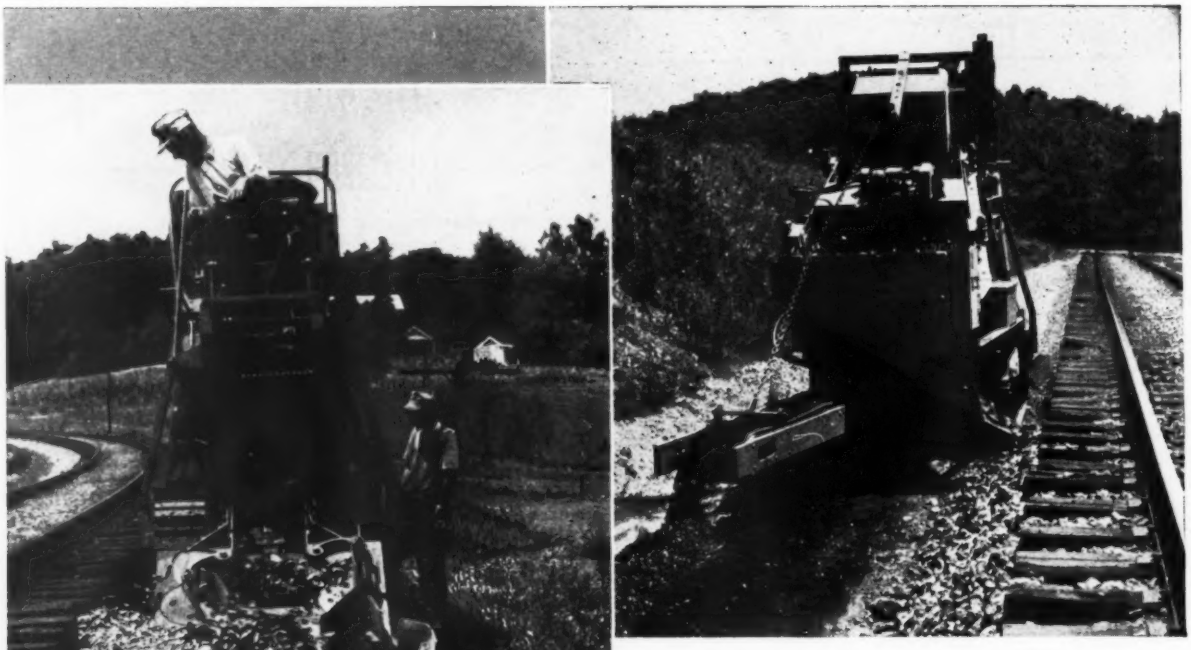

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Rates and Wages—

Ceiling for One but Not for the Other

The problems of railway maintenance officers today are being multiplied because of a combination of circumstances that has resulted in a ceiling being placed on railroad rates but none on the wages of railroad employees. Not only are railroad rates closely regulated by the Interstate Commerce Commission, but they are also influenced by the competitive situation with respect to subsidized forms of transportation. In other words there is a definite limitation on the extent to which the railroads can raise rates without losing a disproportionate amount of business.

On the other hand there appears to be no such limitation on wages. In practically all major industries the employees have been organized into unions which have utilized their economic and political power to force wage rates into an upward movement for which no end is in sight. Most non-railroad businesses are not hampered by regulatory commissions and do not have to contend with subsidized competition. Hence, at least until price control was undertaken by the government, these industries have been relatively free to raise prices as wages have gone up. As a consequence their profit margins have been relatively unaffected.

This is not so on the railroads. While the law of supply and demand is still a factor in determining railroad rates, it has been "repealed" by the unions and the politicians insofar as it had a bearing on the fixing of wage rates of the various classes of railroad employees. There has naturally followed a great "squeeze" on railroad profits—and here's where the maintenance officer comes into the picture. Since the work done under his supervision requires the expenditure of an appreciable part of gross revenues, anything he can do to reduce these expenditures, while maintaining the properties to a high standard, will help to alleviate the squeeze on net income.

This responsibility of the maintenance man to help keep the railroads in the black is an important one, and a large order—much larger than it would be if the activities of the unions and politicians had not had the effect of nullifying some of the laws of economics. To discharge this responsibility successfully officers in the maintenance departments must apply extra effort, more imagination and greater ingenuity to the solution of their problems, and at the same time achieve a complete break with precedent, that is, where precedent is an inhibiting factor. The Lackawanna's highly mechanized "detour" organization for renewing ties and raising track (see page 803 of this issue) and the Frisco's district gang set-up (page 810) are both developments that could not have taken place if those responsible for them had allowed themselves to be influenced by precedent. These are, of course, only two of the many examples of forward thinking by maintenance officers that could be used to illustrate the point.

That this extra burden should be placed on a particular category of railroad men is manifestly unfair. At the same time nothing is to be gained by emphasizing this aspect of the situation. A more realistic view is that there are still many unexplored opportunities for reducing costs—as is being demonstrated almost daily on one railroad or another.

Big Events

W. A. Huckstep
President
American Railway
Bridge and Building Association

C. Halverson
President
Roadmasters' and
Maintenance of Way Association

Stevens Hotel will again be scene of the annual conventions of the Roadmasters' Association and American Railway Bridge and Building Association. Program will include joint sessions and banquet.

• The month of September has again rolled around and with it will come the annual conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge and Building Association, which will be held at the Stevens Hotel, Chicago, September 17-19. The conventions will convene in a joint session on Monday morning, September 17, after which the groups will separate to hold individual sessions. On Tuesday afternoon they will again come together for a joint session at which a number of addresses of common interest to the two groups will be presented.

The complete programs of the two conventions, including the joint sessions, are presented below. The reports of the technical committees – six for the Road-

PROGRAMS

Concurrent Annual Conventions of the Roadmasters' and Maintenance of Way Association and the American Railway Bridge & Building Association

HOTEL STEVENS, CHICAGO, SEPTEMBER 17-19, 1951
(All Sessions Chicago Daylight Saving Time)

JOINT SESSIONS
MONDAY, September 17

*10:00 a.m.—Joint conventions called to order.
Welcome by presidents of the Roadmasters' and B.&B. Associations.
Greetings from the American Railway Engineering Association.
Greetings from the Track Supply Association.
Greetings from the Bridge & Building Supply Association.
*10:30 a.m.—Opening address by J. H. Aydelott, vice-president, Operations and Maintenance department, Association of American Railroads.
*10:45 a.m.—Joint announcements.
*10:50 a.m.—Adjournment to the separate sessions of the two Associations.

ROADMASTERS' SESSIONS

11:00 a.m.—Address by President C. Halverson.
11:30 a.m.—Report of Committee on Economies Derived from Use of Weed Eradicators—G. W. Neal, chairman (superintendent, Chattahoochee Valley, West Point, Ga.).
12:15 p.m.—Adjournment for lunch.

BRIDGE & BUILDING SESSIONS

11:00 a.m.—Address by President W. A. Huckstep.
11:30 a.m.—Report of Committee on Construction and Maintenance of Diesel Fueling Facilities—K. E. Hornung, chairman (architect, Chicago, Milwaukee, St. Paul & Pacific, Chicago).
12:15 p.m.—Adjournment for lunch.

MONDAY AFTERNOON

2:00 p.m. — Report of Committee on Benefits to be Derived from Properly Educating or Instructing Maintenance personnel—R. V. Dangremond, chairman (special roadmaster, Elgin, Joliet & Eastern, Gary, Ind).
2:45 p.m. — Open forum discussion on the Problem of Employing and Retaining Men Capable of Becoming Section Foremen—G. M. O'Rourke, moderator (assistant engineer maintenance of way, Illinois Central, Chicago).
3:30 p.m. — Report of Committee on Proper Operation and Maintenance of Roadway Machines and Work Equipment—P. E. Belley, chairman (roadmaster, Canadian National, Cochrane, Ont.).
4:15 p.m. — Adjournment.

2:00 p.m. — Observance of Association's Sixtieth Anniversary—E. H. Barnhart, chairman of special committee (division engineer, Baltimore & Ohio, Garrett, Ind., and past president of the Association.).
3:00 p.m. — Report of Committee on Developments in the Use of Laminated Timbers—G. W. Benson, chairman (superintendent of bridges, Central of Georgia, Macon, Ga.).
3:40 p.m. — Report of Committee on Economies in Maintenance and Operation of Heating Plants—V. E. Engman, chairman (chief carpenter, Chicago, Milwaukee, St. Paul & Pacific, Savanna, Ill.).
4:15 p.m. — Adjournment.

at Chicago for Track and B. & B. Men

masters and eight for the Bridge and Building – will occupy the greater part of the program of each association. Aside from the committee reports, the Roadmasters' program will include two other features—an address and an open forum discussion. The open forum discussion will deal with the Problem of Employing and Retaining Men Capable of Becoming Section Foremen, and will be a feature of the Roadmasters' program on Monday afternoon. The address, to be read by C. L. LaFountaine, general safety supervisor, Great Northern, will discuss the Importance of Safety in Track Maintenance and will be presented on Tuesday morning.

Aside from the committe reports of the Bridge and Building Association the separate sessions of this group will have one special feature, namely, a program commemorating the sixtieth anniversary of the association, which will headline the Monday afternoon session.

The joint session on Tuesday afternoon will start off with an address on Today's Challenge to Railway Maintenance Officers, by J. P. Kiley, president, Chicago, Milwaukee, St. Paul & Pacific. Next will come a sound motion picture in color, entitled "Song of Mid-America," which is a picture, designed solely for entertainment purposes, produced by the Illinois Central to commemorate its centennial year. Following the picture there will be a round-table discussion of the Problems of Flood Rehabilitation and How They Were Solved.

The social and entertainment aspect of the conventions will be furnished largely by the annual banquet, to be held Tuesday evening, at which the members of both associations and their families will be the guests of the Track Supply Association and the Bridge and Building Supply Association. At the close of the convention sessions an interesting inspection trip has been arranged for both of the railroad groups.

The sessions of the Roadmasters' Association will be presided over by the Association's president, C. Halverson, general roadmaster, Great Northern, Willmar, Minn. The meetings of the Bridge and Building Association will be directed by its president, W. A. Huckstep, general building supervisor, Missouri Pacific, St. Louis.

TUESDAY MORNING
September 18

9:30 a.m. — Report of Committee on Proper Care of New Rail to Increase Its Service Life—C. E. Neal, chairman (general track supervisor, Southern Pacific, San Francisco, Cal.).

10:15 a.m. — Address on the Importance of Safety in Track Maintenance, by C. L. LaFountaine, general supervisor, Great Northern, St. Paul, Minn.

11:00 a.m. — Report of Committee on Economies to be Realized in Handling of Ties—R. H. Campbell, chairman (track supervisor, Southern, Bremen, Ga.).

11:45 a.m. — Adjournment for lunch.

9:30 a.m. — Report of Committee on Fire Protection of Bridges, Trestles and Culverts—T. E. Jackson, chairman (general bridge and building supervisor, Southern Pacific, San Francisco, Cal.).

10:15 a.m. — Report of Committee on Accident Prevention in Maintenance and Use of Work Equipment —R. L. Fox, chairman (division engineer, Southern, Alexandria, Va.).

11:00 a.m. — Report of Committee on Protection of Steel Bridges Against Brine Drippings—M. J. Hubbard, chairman (general supervisor bridges and buildings, Chesapeake & Ohio, Richmond, Va.).

11:45 a.m. — Adjournment for lunch.

TUESDAY AFTERNOON

*2:00 p.m. — Address on Today's Challenge to Railway Maintenance Officers, by J. P. Kiley, president, Chicago, Milwaukee, St. Paul & Pacific, Chicago.

*2:30 p.m. — Sound motion picture in color, "Song of Mid-America," produced by the Illinois Central to commemorate its Centennial year.

*3:15 p.m. — Round-table discussion on Problems of Flood Rehabilitation and How They Were Solved—R. H. Beeder, moderator (assistant to chief engineer, Atchison, Topeka & Santa Fe.).

TUESDAY EVENING
(Grand Ballroom—Informal)

6:30 p.m. — Joint Annual Banquet of the Roadmasters' and Bridge & Building Associations—With Supply Associations.

WEDNESDAY MORNING
September 19

9:30 a.m. — Report of Committee on Planning Required to Increase Productive Time of Maintenance Forces—D. C. Hastings, chairman (track supervisor, Richmond, Fredericksburg & Potomac, Fredericksburg, Va.).

10:15 a.m. — Question Box.

10:45 a.m. — Business Session. Election of officers.

11:30 a.m. — Adjournment.

9:30 a.m. — Report of Committee on Comparative Economies of Materials for Building Exteriors—B. M. Stephens, chairman (assistant chief engineer, Texas & New Orleans, Houston, Tex.).

10:15 a.m. — Effects of the 40-Hour Week on Bridge and Building Maintenance—F. W. Hutcheson, chairman supervisor bridges and buildings, Chesapeake & Ohio, Newport News, Va.).

11:00 a.m. — Business Session. Election of officers.

WEDNESDAY AFTERNOON

12:00 p.m. — Bus trip to inspect welding and laying of continuous rails on the Elgin, Joliet & Eastern. Box lunches to be served on buses.

1:00 p.m. — Bus trip to inspect and see testing facilities at Underwriters' Laboratories, Inc., 207 E. Ohio Street, Chicago. Ladies cordially invited.

*Joint Sessions (will be held in North Ballroom).

R. W. Torbert

R. R. Clegg

Greetings from the Supply Associations

Supply groups reaffirm desire to cooperate in solving maintenance problems

TO MEMBERS OF THE ROADMASTERS' ASSOCIATION AND THE BRIDGE AND BUILDING ASSOCIATION:

This being a non-exhibit year we are happy to have this opportunity, on behalf of the member companies of the Track Supply Association and the Bridge and Building Supply Association to extend greetings to the Roadmasters' and Bridge and Building Associations. We wish here to express our sincere hope that your conventions will be successful by every standard of measurement.

In order to secure maximum attendance at your meetings, our member companies have agreed to refrain from presenting exhibits or displays of any kind in their hotel rooms. In helping to assure the success of the meetings our associations are again sponsoring a banquet to be held on Tuesday evening, September 18. Members of your two associations and their families are cordially invited to be our guests at this dinner.

The mutual desire for doing everything possible to assure the financial integrity of the railroad industry, and to further the national defense program, provides the basis for closely allied common interests on the part of our two supply associations on the one hand and your two railroad groups on the other. Our member companies are constantly endeavoring to improve their products by increasing their efficiency, effectiveness, durability or attractiveness, as the case may be, depending on the nature of the product. At the present time, in view of the indispensability of the railroad industry in the national defense program, our members are particularly anxious to work as closely as possible with you in making the most effective use of available supplies of critical and non-critical materials in performing essential maintenance work and in making necessary improvements. With this objective in mind these companies are not only improving their products while conserving critical materials but are making a concerted effort to assure that railroad orders carry the necessary priority ratings.

To put it briefly, it is the earnest desire of our member companies, year in and year out, through normal times and during periods of national emergency, to be of the greatest possible service to railroad engineering and maintenance officers in helping them to solve problems involving the use of materials, tools or equipment.

R. W. TORBERT,
President,
Track Supply Association

R. R. CLEGG,
President,
Bridge and Building
Supply Association

1 Digging out a grade crossing ahead of "detour" gang, using pneumatic cribbing forks powered by a Spot-Air compressor

2 Spikes in ties to be taken out are removed by two Nordberg spike pullers. Six-year tie-renewal cycle is maintained

D. L. & W.
Renews Ties, Raises Track On Production-Line Basis

Highly-mechanized organization on the Delaware, Lackawanna & Western not only makes effective use of existing machines to renew ties and raise the track, but also utilizes several entirely new units developed on this road, including a tie puller, a ballast loader-distributor and a tie nipper.

•Mechanization of track work is more than a mere phrase on the Delaware, Lackawanna & Western; it is a guiding principle of the road's top engineering and maintenance officers who realize that their efforts to substitute machines for manpower must go on until every possible operation has been mechanized. Probably the outstanding example on this road of what can be done when the goal of complete mechanization has been established is afforded by its tie-renewal and track-raising gangs, better known as "detour" gangs. These organizations are not only notable for their use of existing machines but also for the fact that the performance of one of them is being considerably enhanced by a number of homemade machines tailored in design to perform operations not heretofore mechanized.

A feature article in the August issue described in detail the Lackawanna's practice of programming heavy track-maintenance operations on an annual basis.

In that article, as a background to an understanding of the programming methods used, brief reference was made to the methods and equipment employed by the gangs used on this road for making tie renewals and raising and surfacing track. As part of that background it was brought out that the main line of this road, comprising from two to four main tracks, extends from Hoboken, N. J., on the east to Buffalo, N. Y., on the west; that ties are renewed on a six-year cycle,* with all ties being removed that are not expected to last six years; that ties fit for further service are reused in yard tracks and sidings; that the so-called "detour" system is used when carrying out track-raising and tie-renewal work; and that two detour organizations are in use on the road for doing this work, one of which operates in a 200-mile territory generally east of Binghamton, N. Y., and the other one in a 200-mile territory west of that point.

The detour sections on the Lackawanna range in length from five to seven miles and, where necessary, temporary crossovers are installed to permit traffic to be routed around the section of track in which work is going on. When a gang is working in a detour the handling of traffic is in charge of the transportation department.

800 Ties per Mile

The most highly mechanized of the two organizations on the Lackawanna is the one that works west of Binghamton, although by 1952 it is expected that both gangs will have the same number and types of machines. When inspected recently the detour organization west of Binghamton was working in a territory where the tie renewals were amounting to about 800 per mile. In connection with the renewals the track was being raised about 3½ in. The necessary ballast required for making the raise had been distributed ahead of the tie-renewal gang. Because the placing of this ballast between the rails and on the outside shoulder would interfere with the removal of the old ties and the in-

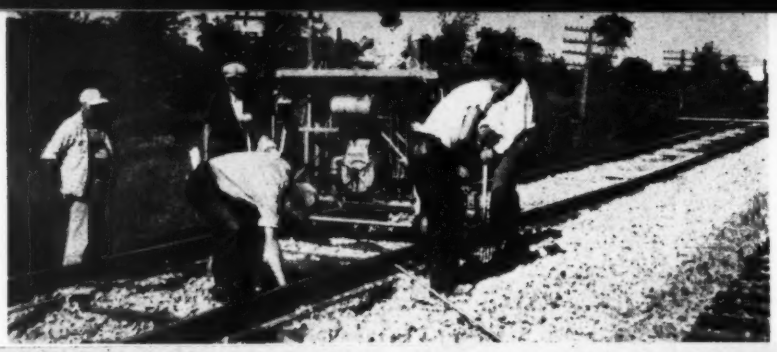
*The reasoning on the Lackawanna is that, by renewing ties on a six-year cycle, soft spots in the track are avoided and the necessity for additional large gangs of the "detour" type is avoided. It is explained, for example, that, if ties were renewed on a three-year cycle, four detour gangs would be required instead of two. Otherwise, for a three-year period, the track would contain a considerable number of soft ties which would make for bad riding qualities.

sertion of new ones, it was unloaded initially with side-dump hopper cars, with the majority of the new ballast being placed in the intertrack space. Obviously, this method of distributing the ballast in advance of the tie-renewal operations requires that later it be redistributed across the track section prior to the tamping operation. The method used to bring about this redistribution of ballast at minimum cost will be described later.

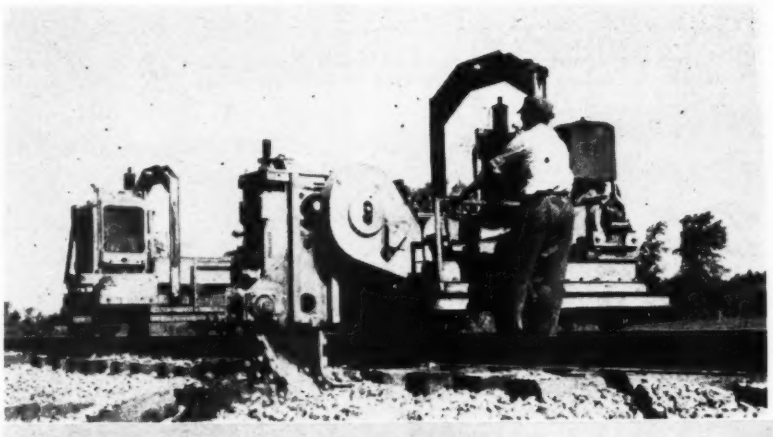
The detour gang that was inspected was renewing an average of 500 ties and raising over one-half mile of track daily. The more important units of standard or conventional mechanical equipment being used by this gang included two Nordberg spike pullers for removing spikes from ties to be renewed, each of which was being operated by only one man; a Nordberg power jack; two Nordberg Cribex machines for cleaning ballast from the spaces from which the old ties had been removed to facilitate insertion of the new ties, and for removing excess ballast from the cribs at highway crossings to facilitate removal of the ties; two Nordberg spike hammers; and a Jackson Multiple Tamper. Also, an Ingersoll-Rand Spot-Air compressor for operating cribbing forks was being used in breaking up the blacktop at highway crossings and in digging out the ballast at bridge ends ahead of the track-raising operation, and a Jackson four-tool outfit was being used to tamp ties through turnouts behind it, the Jackson Multiple Tamper not being able to perform this work.

Using New Machines

One of the most interesting features of the organization was presented by several entirely new types of machines, all of which were devised and built by the Lackawanna's own personnel and forces. One of these is a mechanical tie puller, another is a ballast loader-distributor by means of which the windrow of ballast in the intertrack space is picked up and spread evenly over the track section ahead of the tamping operation. A third is a tie nipper that is used in conjunction with the spike hammers. It might also be pointed out that the power jack has a built-in level board, applied by the railroad, which can be seen by the operator of the power jack and which eliminates the need for another man carrying a track level and directing the power-jack operator.



3 Using a power jack equipped with a built-in track level that can be seen by the jack operator, the track is raised and leveled at the joints and centers



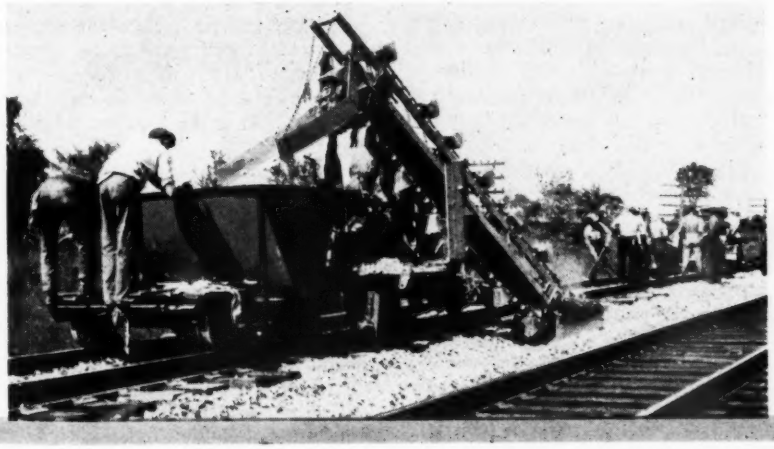
5 To facilitate insertion of the new ties two Cribex machines are used to remove excess ballast from the spaces from which the old crossties had been removed

7 One of the two Nordberg spike hammers in operation. Man at left is bearing down on handle of homemade tie nipper, one of which is used with each hammer

The tie puller, which is self-propelled, is relatively simple in construction but fast in operation. The power source on this device consists of a Briggs & Stratton engine connected to a single-drum hoist, both mounted on a push car. Fastened to one side of the car, and extending out from it at right angles, is a boom with a pulley at the outer end. So that it can be folded back onto the car when not in operation the boom has a hinged connection at its inner end; it also has a telescopic feature so that it can be shortened if this is required by limited side clearances. A cable wound on the drum of the hoist is reeved through the pulley at the outer end of the boom and has a pair of tie tongs fastened to the

4 With the homemade tie puller, which is simple in construction, fast in operation, three men can do the work that on most jobs formerly required two 5-man gangs

6 Following behind the Cribex machines is a push car on which extra crossties are carried for use as needed. About 800 ties were being renewed per mile of track



8 The ballast loader-distributor picks up windrow of ballast from the intertrack space and distributes it as needed over the track ahead of the tamping operation

free end. To remove a tie from the track, which is a matter of seconds with this machine, the tongs are attached to the tie and the drum of the hoist is thrown into gear.

Three Men Are Used

Three men are used with the mechanical tie puller, one for operating the machine, one for handling the tongs, and one for barring the old ties clear of the new ties that have been distributed along the track. It is reported on the Lackawanna that these three men, with the aid of the tie puller, do the work that on most jobs formerly required two five-men gangs. The Norberg Manufacturing Company is designing the tie puller for manufacture and will shortly make it available to the railroads generally.

The ballast loader-distributor is also a self-propelled track-mounted machine which picks up the windrow of ballast from the intertrack space by means of a power-driven endless conveyor incorporating a series of buckets. The ballast from the buckets is dumped into a chute which delivers it to a hopper behind the machine. Manually-controlled gates in the bottom of the hopper make it possible to discharge the ballast as needed across the track section. Three men are used in operating the loader-distributor—an operator and two laborers who, stationed on a platform directly behind the hopper, manipulate the discharge gates. It is said on the Lackawanna that, if done by hand, the work performed by the loader-distributor would require 25 men.

Nipper Simple but Effective

Like the other mechanical devices described above, the tie nipper that is used in conjunction with the spike hammers is a simple but effective device. The basis of this unit consists of a pair of double-flanged wheels on each rail, the two pairs being connected by a crossbeam. Mounted on the crossbeam is a frame which acts as the fulcrum for a lever by means of which the lifting action for nipping the ties is applied. Fastened to the forward end of the lever is a pair of tie tongs. The lever is so positioned with respect to the fulcrum that a man at the opposite end can easily exert enough pressure to nip the tie firmly against the rails while the spikes are being driven. Within convenient reach of the operator is a lever by means of which the tie tongs can be fastened and released. One tie nipper is used with each of the spike hammers, and follows directly behind it.

In addition to the equipment mentioned above the tie-renewal organization includes a Fairmont derrick car which, drawn by a motor car, is used for lifting various units of equipment off the track at the end of the day's work and replacing them on the track the following morning; a push car which, following behind the two Cribex machines, carries extra ties; and a "trailer train" consisting of a motor car, two trailers, and three push cars. Wherever possible, the men are hauled to and from the site of the job in highway trucks, but if this is not possible because of local

9 Track raised by the "detour" gang is tamped with a Multiple Tamper. Gang was raising about a half mile of track daily

10 Following behind the tamper a gang of 12 men lines track, reapplies rail anchors and tightens bolts when necessary

conditions they are transported on the trailers. The push cars are used for hauling spare parts, fuel, tools and setoffs for the machines.

Five Separate Gangs

The Lackawanna's standard organization for a detour gang, using the equipment mentioned above, calls for a total of 95 men, not including the foremen or assistant foremen. The organization is divided into five separate gangs, each under the supervision of a foreman, and in most cases one or two assistant foremen. The organization that was inspected was organized in accordance with what is known as "Set-Up A" on this road. (At the present time the organization operating east of Binghamton varies somewhat in the number of men in the gang and the types of equipment used, and is organized in accordance with what is known as "Set-Up B"). In Set-Up A the five units comprising the total organization are numbered "1-A," "2-A," etc., beginning at the forward end of the gang.

Comprised of a foreman, 2 assistant foremen and 16 laborers, gang No. 1-A, which incorporates the Nordberg power jack, provides crossing protection as required, digs out grade crossings ahead of the tie-renewal work, pulls spikes from the ties to be renewed, raises and levels the track at the joints and centers with the power jack, shovel tamps the ties at these points, removes the tie plates from the ties to be renewed, and knocks off the rail anchors adjacent to these ties. A portion of this gang may drop back later and repair grade crossings behind the organization as a whole.

Gang No. 2-A, comprised of a foreman, 2 assistant foremen and 28 laborers, takes out the old ties, with the tie puller, prepares the new tie beds with the Cribex machines, puts in and spaces the new ties, inserts the tie plates, drives the spikes with the spike hammers and checks the gage. Gang No. 3-A, comprised of a foreman, 3 assistant foremen, an operator for the Multiple Tamper, and 13 laborers, is organized largely around the ballast loader-distributor and the tamper. The gang distributes the ballast with the loader-distributor, adjusts surface irregularities ahead of the tamper, using under-tie jacks, feeds ballast to the tamper, and nips up the ties while they are being tamped.

Gang No. 4-A, consisting of a foreman and 12 men, reapplies the rail anchors, tightens bolts where necessary and lines the track. Gang No. 5-A, comprised of a foreman, 2 assistant foremen and 26 laborers, dresses the track, sorts and piles ties, tamps ties through switches with a Jackson 4-tool outfit, and is available for use with a work train when needed.

Starting Times Staggered

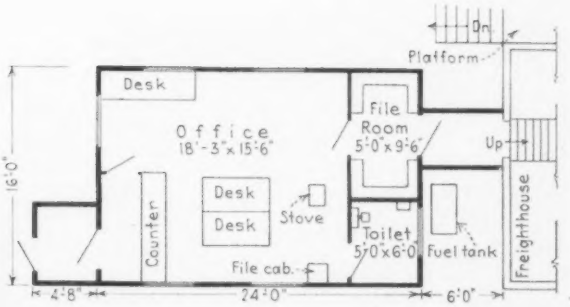
The individual gangs comprising the overall organization start in the morning at different times so that none of them will be delayed in getting started while waiting for the gang ahead to get out of the way. The first unit to get started is gang No. 1-A which begins work at 6:00 a.m. Gang No. 2-A starts at 6:30, 3-A at 7:00, 4-A at 7:30, and 5-A at 8:00. (These are the specified starting times. They may have to be varied occasionally because of local conditions.) While gang No. 3-A, which incorporates the Multiple Tamper, does not start work until 7:00 a.m., the tamper operator reports for duty an hour earlier to give him an opportunity to get the machine serviced and started so that it will be ready to go when the remainder of the gang arrives on the job. A repairman qualified for operating the Multiple Tamper comes on duty at 7:30 so that he can "spell" the regular operator and take over the operation of the tamper when the regular operator goes off duty after eight hours. Another man, who serves as a machinery repairman, comes on duty at 6:00 a.m. to service the other machines, assist in their operation, and make various running repairs.

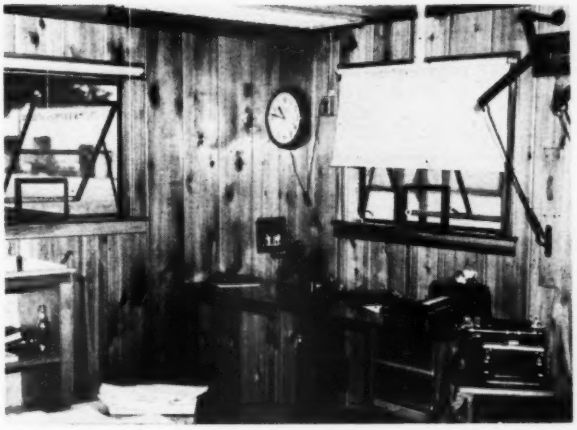
Each roadmaster's district of the Lackawanna has a maintenance-of-way work-equipment repairman, who, while the detour organization is on his territory, keeps in close contact with it, providing additional assurance that the equipment will receive proper care and that, if any mechanical trouble develops during the day, necessary repairs or adjustments can be made with a minimum of delay.

As brought out in the August issue in the article describing the Lackawanna's methods of programming heavy track work, the schedule of each of the two detour organizations is determined early in the year for the entire working season, thus assuring maximum utilization of the equipment incorporated in them. This factor, combined with the high degree of mechanization of these gangs and their well-balanced organization, is given credit on the Lackawanna for the relatively high output obtained per man-hour.

Agent's office at Sparta . . .

New building housing the office is made of Steelox panels recovered from labor camps constructed during the war. An enclosed passageway connects new structure with existing freighthouse





Features of the interior include walls lined with varnished knotty cedar, a built-in telegraph desk, bright lights, large ventilating windows and oil heat. Details are given in drawing

To house agents at locations where the volume of business no longer justifies continuance of station buildings, and at the same time to provide space for section gangs and other forces, the Pere Marquette district of the Chesapeake & Ohio . . .

. . . Consolidates Facilities in Prefabricated Metal Buildings

• Utilizing material for the most part recovered from several prefabricated steel buildings, which were built as labor camps during World War II, the Grand Rapids division of the Pere Marquette district of the Chesapeake & Ohio has recently built several structures to replace old stations and to provide space for section gangs and other forces. Because passenger traffic had dropped off considerably from previous years and this service had been discontinued on certain lines, the railroad retired and razed several old obsolete-type structures and consolidated their functions in the new prefabricated buildings.

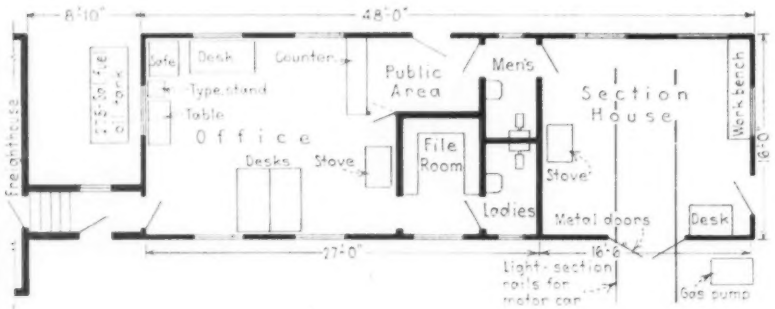
Three labor camps of prefabricated steel were built on the Grand Rapids division, each designed to accommodate about 100 men. Each camp included 12 hutments, 16 ft. by 16 ft. in size and bunking 8 men each, another building for washing and toilet purposes, and a 16-ft. by 100-ft. building which provides a dining hall, kitchen, pantry, commissary store and clerk's quarters. The exterior walls and roofs of these buildings were constructed without framework of Armco Steelox panels erected on previously poured concrete foundations and floor. These panels are of 20-gage steel, 16 in. wide, and are designed to interlock with each other. When fitted together, they form self-supporting side walls carrying a gable roof, with openings in the walls, as desired, for standard steel doors and window ventilating sash. The panels are secured to the foundation and to each other by means of suitable connecting pieces and fastenings. Interior partitions were provided as necessary.

When erected the buildings provided good housing quarters for the men, were electrically lighted, and presented a pleasing appearance. However, since there was little need for the buildings in their original locations following the war, it was decided to use them to better advantage by dismantling the structures and utilizing the recovered material for constructing improved freight office facilities at some towns and for continuing the road's program of modernizing its

Facilities at Fremont . . .

Constructed of material recovered from three labor camps, this structure houses an office for the agent and his forces at one end and a large room for the section forces at the other end

This is how the agent's office looks to patrons standing in the public area. Door in background gives access to existing freighthouse through a passageway. Floor plan is given below



section car houses.* In the latter program the new facilities provided are generally designed to accommodate a highway motor truck, a motor car, the four-tool pneumatic tie-tamper outfit with which each section is equipped, and other tools, and include an office for the foreman.

Sparta, Mich., is a progressive little town on the Pere Marquette District's main line between Grand Rapids, Mich., and Bay View. Its passenger station, of wood frame construction built about 1878, was badly in need of extensive repairs, and was difficult to heat. Moreover, since Sparta is only 15 miles from the city of Grand Rapids, the railroad's passenger business at that point had progressively lessened until it was practically nil; hence, the agent at Sparta is now primarily concerned with handling freight business, there was no necessity for providing the conventional station with waiting room, etc. In view of these considerations it was decided to raze the old passenger station and move the agent and his staff one and one-half blocks south to a new depot-and-office building adjacent to the existing freighthouse.

About one and one-half labor camp hutments were used in the construction of this new depot and office to form a one-story building 16 ft. by 24 ft. in size (see accompanying drawing). The building was laid out parallel with the tracks and was erected on a concrete footing, 18 in. deep, poured monolithically with a 4-in. concrete floor slab. It provides an adequate office for the agent, his clerk and a stenographer, a record room, a toilet room, and a small public area and counter.

Because of the cold weather that prevails generally at this point, an enclosed entryway and an enclosed passageway from the new building to the freighthouse were constructed, and the side walls of the building were lined on the interior with knotty cedar and insulated with 3-in. rock wool batts. Ceilings of Celotex sheets were provided and the attic area was vented with a gravity-type roof ventilator. The office is heated by a large Duo-Therm oil-burning heater, vented through the roof, which draws its fuel supply from an outside 275-gal. oil storage tank.

The natural beauty of the knotty cedar lining is preserved and enhanced by a transparent varnish coating, while the ceiling was painted a soft gray color. Augmenting the natural light through the windows are fluorescent lights placed in egg-crate fixtures. An agent's desk, harmonizing with the knotty cedar lining, was built in one corner of the office. The other furnishings, including two desks, a typewriter stand, and a file cabinet, are of metal and are new. The concrete floor is painted green.

The exterior of the new building was painted the light gray color that is standard on the C. & O. New sidewalks were built outside to the public walk, and a number of short pieces of rail were planted upright in the ground on the street side of the new building to prevent damage from vehicular traffic. The tracks in the station area were planked over and the platform was given a cold-mix bituminous wearing surface to facilitate the trucking of "head end" business. Crushed limestone was placed between the building and the public walk to prevent an unsightly growth of weeds.

Building Combines Two Services

Another location selected for the re-use of the Steelox buildings was Fremont, Mich., where passenger train service had been discontinued. Rather than repair the old obsolete passenger station, which also housed the office of the freight agent, it was decided to construct

*See "Section Tool Houses Go Modern" in the February 1950 issue of Railway Engineering and Maintenance.

. . . and at Lansing

In the new building at this point are consolidated the facilities of several departments. Room shown here is part of the car men's shop. The drawing below is a floor plan of the building

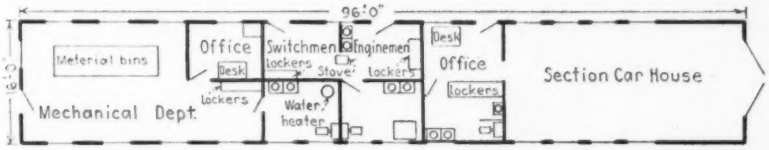
The space allotted to the section forces is large enough to accommodate an ample supply of equipment, tools and materials in addition to the section highway truck and track motor car

a new freight agent's office adjacent to the freighthouse. The section tool house at this point was only large enough to accommodate the section motor car and tools, and there was need for larger quarters to house the compressor outfit, and to give the section men access to toilet facilities. Hence, it was decided to make the new building at Fremont sufficiently large to provide the space needed for the section forces as well as to house the freight agent and his staff.

Using the material recovered from approximately three huts, the panels were erected on a concrete footing and concrete slab. In this instance a concrete sill was used under the exterior walls to provide a greater ceiling height within the structure. The new building is 16 ft. by 48 ft. in size and provides space for the agent, his clerk and stenographer, a public area, a file room, two toilet rooms, and the facilities for the section crew (see accompanying drawing). An enclosed passageway gives access from the rear of the office to the existing freighthouse.

Treatment Same as at Sparta

The treatment of this building is the same as that at Sparta in so far as the design, lighting, heating, finishing and furnishings are concerned. The room alloted to the section forces provides space for a motor car, an air compressor, tool racks, material bins, a work bench, a bench for the men when eating lunch, and a desk and chair for the foreman. A door from this



room gives access to the men's toilet room.

Another instance where the Steelox panels were used in the construction of a new building is at Lansing, Mich. At this point the car forces, switchmen, enginemen and section forces all utilized separate wood frame buildings. To provide these employees with toilet and locker facilities and at the same time to get rid of several old unsightly buildings, it was decided to construct a single structure, using recovered Steelox panels.

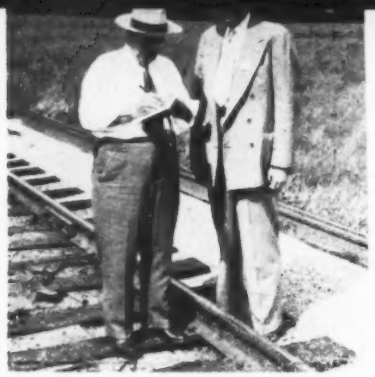
Construction Details

This new building, 16 ft. by 96 ft. in plan (see accompanying drawing), was constructed in a suitable location in the yard on a concrete footing, sill, and floor slab. In the section car house and in the mechanical employees' rooms the walls are lined with tongue-and-groove sheathing and are painted light gray. All offices, toilet rooms, and quarters for the enginemen and switchmen are lined with knotty cedar coated with a transparent varnish. Oil-burning heaters are used throughout.

The space for the car-service employees is equipped with material bins and racks, work benches, waste-cleaning vat, oil drums and pumps, and miscellaneous car-department tools and supplies. The car foreman is provided with his own office. Also there are lockers and wash facilities for his men. The switchmen and enginemen have separate rooms for their lockers but share a common toilet and shower room.

The section car house has adequate space for a highway truck, motor car, portable air compressor, oxyacetylene welding equipment, material bins, tool racks, and benches for seating the men while eating lunch. In addition, the foreman has his own office and he and his men have their own toilet and locker facilities.

Besides providing needed building facilities and enabling the railroad to rid itself of several old obsolete buildings currently requiring extensive repairs, the new Steelox structures are reported to have resulted in a higher employee morale. The men are said to be happy in their new quarters, taking pride in their continued fine appearance. With means provided for keeping themselves clean, and with the interiors of the buildings painted, brightly lighted, warm and well - equipped, the employees sense the fact that they now have a place to meet the public and visitors on even terms, and take care to keep the premises clean and orderly.

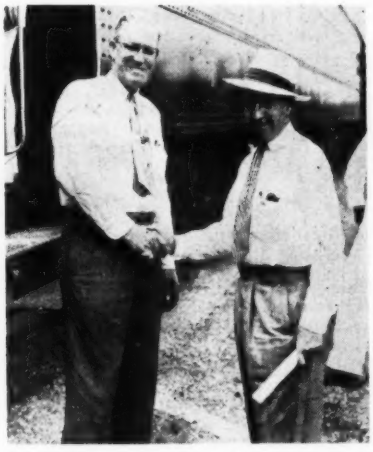


A. G. Reese (left), dist. maint. engr., C.B.&Q., jots down some pertinent notes while talking to E. P. Olson, asst. gen. mgr. of the West. dist. of the Frisco

T. B. Hutcheson (left), asst. ch. engr., S.A.L., and H. W. Kellogg, div. engr. C.&O., see something of special interest at head end of the rail-laying gang

As this picture was taken E. L. Anderson, Frisco ch. engr., who was host to the committee on the trip, was figuring out the seating arrangements for lunch

M. B. Allen (left), div. engr. N.Y.C.&St.L., and H. C. Minteer, div. engr., C.M.St.P.&P., watch one of two bolting machines that followed rail-laying crane



Two Frisco men on the trip were E. Long (left), rdm., and G. L. Harris, div. engr.

A.R.E.A. Committee

To an increasing extent committees of the American Railway Engineering Association are making first-hand inspections of developments related to their assignments. This is an account of such an inspection made by the Committee on Economics of Railway Labor to familiarize itself with track-maintenance practices on the St. Louis-San Francisco, particularly a new type of maintenance organization which is producing substantial savings in labor costs.

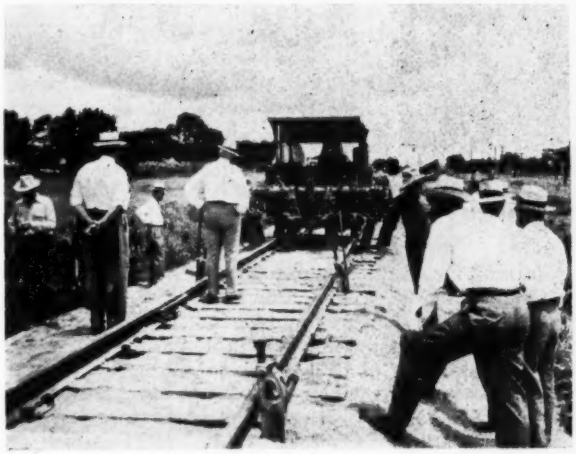
• Assignment No. 2 of Committee 22, Economics of Railway Labor, of the American Railway Engineering Association is to make analyses "of operations of railways that have substantially reduced the cost of labor required in maintenance-of-way work." For presentation at the 1952 convention the subcommittee handling this assignment decided to make a study and prepare a report on the organization of track maintenance forces on the St. Louis-San Francisco, which has been revamped in major respects in recent years. To give the committee in general, and Subcommittee 2 in particular, an opportunity to see the Frisco's organization at first hand it was decided to hold a two-day meeting of the entire committee at such a location that a day could be devoted to an inspection trip over a section of the Frisco's lines.

That is how the committee happened to meet at the Mayo hotel, Tulsa, Okla., on July 10. The plan was to spend that day transacting routine business, and then early on the following morning to embark on a special train which was to take the committee to Kansas City, Mo., making stops at various points on the way to permit the committee members to inspect various types of track-maintenance gangs in action.

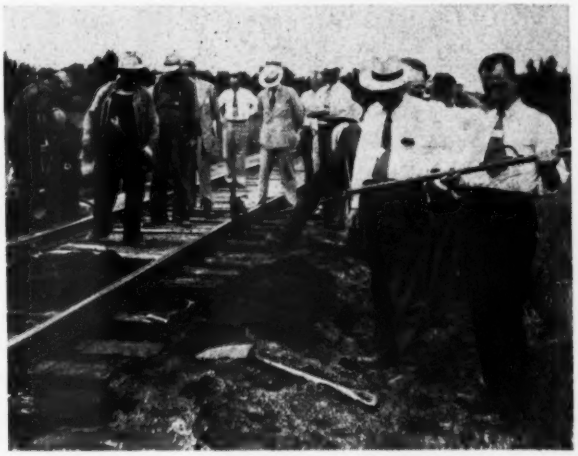
Presiding over the committee meeting as it convened in the hotel at 9:30 a.m. on July 10 was Chairman H. E. Kirby, cost engineer, Chesapeake & Ohio. Twenty-two members of the committee were present, not including C. B. Bronson, maintenance of way assistant to the vice-president, New York Central System, who was representing the Board of Direction. (R. J. Gammie, vice-chairman of the committee and chief engineer, Texas & Pacific, is also a member of the Board of Direction.) During the day E. L. Anderson, chief engineer of the Frisco, appeared briefly at the meeting to explain the plans that had been

C. B. Bronson, m. of w. asst. to vice-pres., N.Y.C. Sys., who represented the Board of Direction of the A.R.E.A. on the trip, made complete notes on the organization of the Frisco's system rail-laying gang which was working near Foyil, Okla.

Left to right—C. R. Wright, asst. ch. engr., N.Y.C.&St.L.; F. W. Creedle, asst. engr. maint., C.&N.W.; H. L. Woldridge, div. engr., Frisco; R J. Gammie, ch. engr., T.&P., (committee vice-chairman); and H. E. Kirby, cost engr. C.&O., (chairman)



The group of committee members shown in this picture is interested in the operation and performance of a Multiple Tamper



C. Johnston, div. engr., L.&N., examines a light track level while Edward Wise, Jr., engr. m. w., L.&N., also shows interest

Sees New Maintenance Setup in Action

made for the inspection trip the following day.

Among the committee members is G. L. Harris, division engineer of the Frisco at Memphis, Tenn., whose presence at the meeting on July 10 gave the other committee members an opportunity to familiarize themselves with the nature of the Frisco's organization. During the discussion at that meeting, and on the inspection trip the following day, it was brought out that the basic feature of the new track - maintenance organization consists of what are called district gangs which fall into one of two general classifications:

(1) Used as a supplementary force to section gangs. District gangs in this classification do not have a patrol unit or responsibility for any particular section of track.

(2) The gangs in this classification have a patrol unit included in the gang and have responsibility for a definite section of track Where district gangs in this classification are in existence the section gangs have been discontinued. Patrolling and the light jobs, referred to as "rabbit" work on the Frisco, are carried out by an assistant district gang foreman, assisted by one or more men from the district gang, as necessary for the particular work in hand.

The plan on the Frisco is for the district gangs to do practically all heavy maintenance jobs except laying rail, which is performed by a system rail-laying organization. Thus, the district gangs perform such work as making tie renewals, laying relay rail, raising and surfacing track, cutting weeds on the right of way, cleaning ditches, repairing fences and unloading and distributing ties, rails, and fastenings. Occasionally, however, it may be necessary to organize extra gangs to perform some of these duties.

It was emphasized that the district gangs are not extra gangs in any sense of the word. Each of them has a permanent headquarters point where it ties up every night and from which it is transported to the site of the work each day in highway trucks or on motor cars.

The first district gang on the Frisco was established at Olathe, Kan., on October 16, 1947, to supplement the work of section forces on two main tracks between Rosedale and Paola. Prior to establishment of this district gang there were nine section gangs in this territory, and at the time that the district gang was organized four section gangs were discontinued and the territories of the remaining gangs extended. The district gang

Here the committee is viewing one of the district gangs at work renewing ties and surfacing the track. This unit was using a 4-tool vibratory outfit for doing the tamping work. At right (back to camera) is A. D. Alderson, maint. engr., Soo Line

Among the Frisco representatives in evidence on the trip were V. E. Yeargain (left), asst. rdm., and R. A. Stolle, rdm.

took over the heavier and out-of-face jobs, while the section gangs continued to do the lighter work and minor jobs.

Organization Rapidly Extended

The work accomplished by the first district gang was so successful that in about a year's time the railroad began establishing additional district gangs. By the time the 40-hr. week went into effect on September 1, 1949, the road had a total of 68 district gangs, all falling under classification No. 1, as outlined above. It then began to give thought to the possibility of eliminating all section gangs on a roadmaster's territory and establishing district gangs under classification No. 2. Such an arrangement was put into effect on July 1, 1950, on the Fiftieth track division of the Creek subdivision, Sapulpa, Okla., to Francis and Okmulgee, Okla., to Muskogee. Since that time additional roadmasters' territories have been reorganized on the same basis, with the result that, as of July 1, 1951, 13 roadmasters' territories out of a total of 36 have been provided with district gangs under classification No. 2. However, on four of the 13 roadmaster's territories one section gang was left in existence to handle either a branch line or a terminal. The assistant foremen of district gangs under classification No. 2 do their work with the aid of an inspection-type motor car or a very light section-gang motor car.

At the present time the railroad has 90 district gangs in both classifications, 42 of which fall under classification No. 2. Each of these gangs has a territory ranging from about 30 to approximately 50 miles of track, and is usually headquartered at a point about midway of its territory. The railroad feels that it has effected substantial savings in labor costs as a result of the new type of organization.

At 7:30 a.m. on Wednesday, July 11, a special train bearing the committee pulled out of the Tulsa station, bound for Kansas City. The train consist included a Diesel locomotive, a buffer coach for the use of the crew, three business cars, and, on the rear, a combination buffet-lounge car. A sufficient number of chairs, facing to the rear, had been placed in the lounge portion of the latter car to accommodate the entire group.

Frisco personnel present on the train to answer questions included Chief Engineer Anderson; F. E. Short, assistant chief engineer, Western district; H. L. Woldridge, division engineer at Tulsa, whose territory includes the trackage between Tulsa and Afton (see map), which is known as the Cherokee subdivision, and R. A. Stolle, roadmaster at Tulsa, who also has jurisdiction over the Cherokee subdivision. To help assure the success of the trip various members of the Frisco's operating department staff were also on the train as it left Tulsa, including General Manager L. B. Clary, Assistant General Manager E. P. Olson (Western district), Superintendent G. H. Jury, and Superintendent P. J. Schmitz. Also, L. T. Nuckols, chief engineer of the Chesapeake & Ohio, was present as an additional guest.

En route to Afton, Roadmaster Stolle explained that he had one district gang operating on the Cherokee subdivision and five section gangs, each of the latter consisting of a foreman and three men. Currently a rail-renewal program is being carried out on this subdivision, and after this is completed the section gangs will be discontinued. At the time of the trip Mr. Stolle also had two 26-man extra gangs putting in ties and another extra gang distributing rails and fastenings, all working between Tulsa and Afton. In addition, the road's system rail-laying organization was working in this territory, putting in 132-lb. rail to replace existing 110-lb. material. The practice on this road when making tie renewals is to give the track a 3-in. to 4-in. raise and to tamp the ties with unit tampers. After the rail has been renewed the track is given another 2-in. to 3-in. raise, and tamped with a Multiple Tamper.

Rail Gang Is First Stop

The first stop of the special train was made at Foyil, Okla., 36 miles from Tulsa, where the group transferred to a train of trailers drawn by an extra gang motor car, which proceeded a mile or two farther where the system rail-laying gang was working. This was a highly mechanized organization using a

A. A. Cross, div. engr., N.Y.N.H.&H., had to leave the special train at Miami, Okla., in order to make a connection

P. J. Schmitz, supt. Frisco, and G. A. Kellow, asst. to gen. mgr., C.M.St.P.&P., and chairman of subcommittee No. 2

L. T. Nuckols (left), ch. engr., C.&O., and F. N. Beighley, div. engr., Frisco. Nuckols was a guest of the committee

Raco bolting machine for removing nuts from the track bolts, two Nordberg spike pullers, four Nordberg adzers, a Burro crane for handling the rail, two Raco bolting machines for applying nuts on the new bolts, and pneumatic tools for driving spikes.

After about 30 min. inspecting the rail gang, the group again boarded the trailer train and was taken to Bushyhead, Okla. 3 miles from Foyil. In the meantime the track had been closed to allow passage of the special train which arrived in Bushyhead in time to permit the group to board it at about 11:00 a.m.

Twenty minutes later the train stopped again so that the group could inspect a 26-man gang which was giving the new rail a 3-in. raise and tamping the ties with a Multiple Tamper. After this stop the train moved on amid reports of increasing high-water troubles ahead and extensive flooding and washouts of tracks and bridges on railroads west of Kansas City. At Afton, before moving on to the Afton subdivision, a stop was made to permit E. Long, roadmaster, and F. N. Beighley, division engineer, to join the group. Mr. Beighley's territory includes the trackage between Afton and Kansas City, while Mr. Long is roadmaster of the Afton subdivision which includes the territory between Afton and Edward, a point about four miles south of Ft. Scott, Kan.

The district-gang type of organization under classification No. 2 was put into effect on the Afton subdivision on May 1 of this year. There are three such gangs in this 84-mile section of track, headquartered as indicated on the accompanying map. In addition Mr. Long has one section gang on another 11 miles of branch line track under his supervision. The line between Afton and Edward is a medium traffic main line and is being laid with new 115-lb. rail.

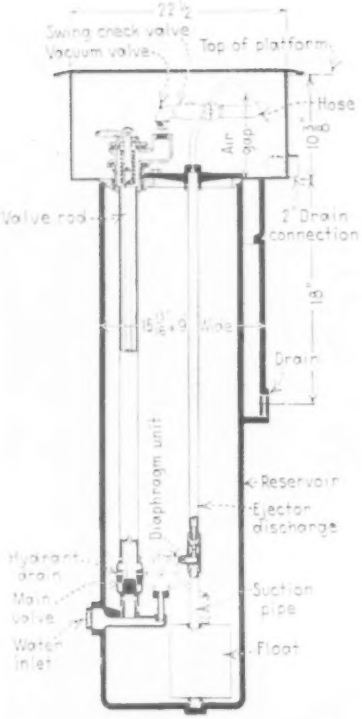
See Tie-Renewal Gang

At about 1:30 p.m., following lunch on the train, the group made another 20-min. stop to inspect a district gang that was engaged in renewing ties. This unit was using a Jackson 4-tool vibratory outfit for doing the tamping work. It was brought out that in addition to power-tamping equipment, various other types of work equipment are made available to the district gangs as needed to permit them to operate at maximum efficiency.

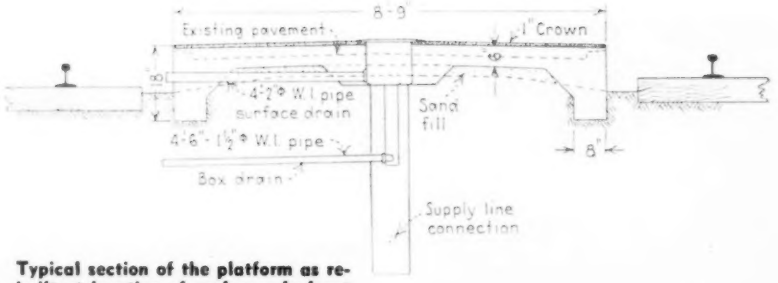
By this time it had become overcast and a few drops of rain had begun to fall. Simultaneously there were increasingly gloomy reports regarding high-water troubles ahead. Other railroad lines extending west and southwest of Kansas City were already out of service and were seeking to reroute some of their trains over the Frisco. However, when the special train reached Ft. Scott it became evident that it would not be possible for it to finish the trip because of a washout between that point and Kansas City. At Ft. Scott, therefore, the group transferred to a bus chartered by the railroad which took it the remainder of the distance to Kansas City, where the committee disbanded.

Frisco lines inspected by Committee on Economics of Railway Labor on July 11

Notwithstanding the fact that the inspection trip had to be terminated somewhat short of the original goal, the committee members had been given a first-hand view of various types of gang organizations in use on the Frisco and, through questioning of members of the Frisco supervisory organization, had been able to familiarize themselves thoroughly with the district-gang setup—a type of organization that is regarded on the Frisco as an important phase of its effort to counteract the effect of increasing labor costs.



Above—Sectional view of new McGarry hydrant. Below—One of the hydrants in service at coach yard of Fort Street Union Depot, Detroit. Hose is kept on portable reels to permit use at any point



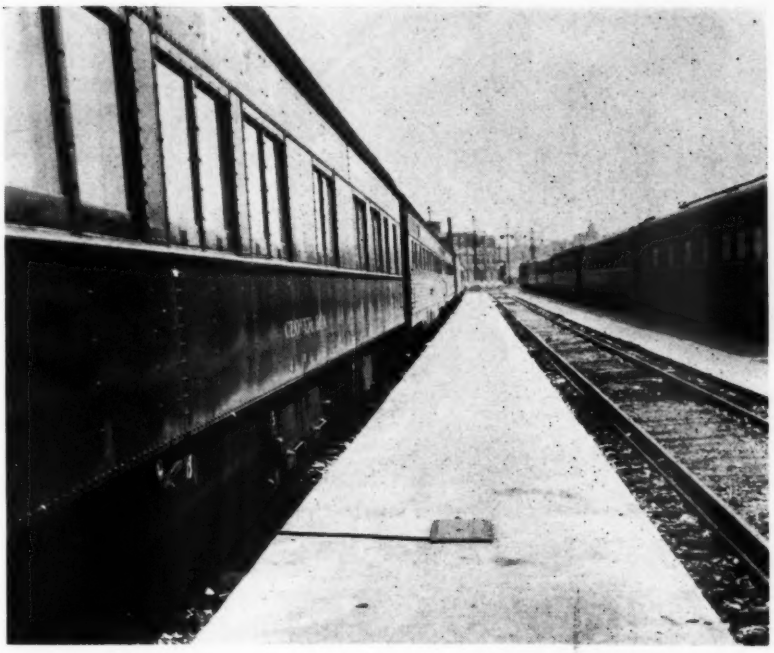
Typical section of the platform as rebuilt at location of each new hydrant

New Hydrants Safeguard Coach Drinking Water

To assure that passengers leaving Detroit, Mich., will have sanitary water, the Fort Street Union Depot installed new flush-type platform hydrants at its Twenty-First Street coach yard. Complying with U. S. Public Health Service regulations, these hydrants are designed to be pollution-proof, non-freezing and self-draining.

• The problem of providing potable water complying with the United States Public Health Service regulations for coaches was recently overcome by the Fort Street Union Depot at its coach-servicing yard near 21st Street, Detroit, Mich. This was done by replacing 30 water boxes which did not comply with the regulations with a similar number of flush-type McGarry platform hydrants. As part of this work three of the existing concrete platforms were revamped in the vicinity of each hydrant, and were re-surfaced throughout with a ¾-in. topping of Emeri-Crete flooring.

The Twenty-First Street coach yard has eight tracks at 18-ft. track centers, with a concrete service platform 8 ft. 9 in. wide between each pair of tracks and a platform 4 ft. wide on the outside of the first and longest track. Because the number of passenger cars now being serviced at the yard can be handled on the four longest tracks, only the hydrants of three intertrack platforms were replaced at this time. These platforms are 1548 ft., 1418 ft. and 1214 ft. long, and were equipped with 12, 11 and 7 of the new hydrants,



Flush-type hydrants offer no impediment to use of mobile coach-servicing equipment

respectively. The hydrants on each platform are spaced about one coach-length apart and such spacing is staggered with each adjacent platform.

Principle of the Hydrant

The McGarry hydrant is devised to be pollution-proof, self-draining, and non-freezing. In principle it passes potable water from the main supply line to the service hose without the possibility of back siphonage, and neither water stored within it nor water contaminated by outside sources can enter the flowing stream while it is being delivered, nor get into the line when the hydrant is shut off.

Essentially, the hydrant consists of three major parts—a reservoir, a form box, and a sump. The reservoir, of a length necessary to keep critical hydrant parts and standing water below frost level, contains the main hydrant valve, riser, and an ejector unit (see sectional diagram). The main supply of water enters near the base of the reservoir, passes through the main valve and flows upward in the riser to the platform box, and thence through a vacuum valve and a swing-check valve to the service hose connection.

The main valve rod is located within the riser pipe and is operated by a lever located in the platform box. When the valve is in the closed position, any water remaining within the riser pipe escapes into the reservoir through small ports located just above the valve plunger, thus preventing contamination of the supply water and stoppage of the line through freezing. When the valve is in the open position, these small ports are blocked by the valve plunger so that the water stays within the confines of the riser.

The water that escapes through the ports into the reservoir falls into the sump from where it is removed by the ejector unit. This unit has a float that operates a valve in a diaphram assembly (an improvement over the pilot valve formerly used), when a predetermined depth of water stands in the sump, and causes a stream of water to be taken from the main supply line and diverted into the ejector discharge pipe, filling it and overflowing into the platform box. In doing so, this diverted water siphons drainage water from the bottom of the sump. When sufficient water has been drawn from the sump, the float sinks, thus shutting off the water from the ejector discharge pipe. Hence, with this arrangement, the hydrant is self-draining.

Water is discharged from a curved end of the ejector discharge pipe and falls through an air gap into a pocket that is cast integrally on the outside of the reservoir. From here, the discharged water is led, by a pipe connected at the bottom of the pocket, under the platform to the track ballast where it finds its way to the yard drain.

A further provision to insure adequate drainage is a 2-in. drain connection with its flow line at the floor of the platform box. This drain handles any water that might escape due to a poor hose connection or in the event that the drain at the bottom of the pocket is inadequate and backs up into the box, and carries it under the concrete platform for wasting at ground surface.

At the Twenty-First Street yard the hydrants are installed with their box covers placed sufficiently above the level of the existing platforms to clear hinge pins of box covers. The old platforms were removed for a distance of 8 ft. on each side of the hydrant, and new platforms, forming a ramp to the remaining old pavement and crowned at the centers, were constructed. This arrangement precluded any surface drainage from entering the hydrant boxes. The box covers are kept closed at all times when not in use to prevent wind-blown debris and trash from getting into the boxes.

Other Platform Alterations

Other platform alterations consisted of removing the curbs to the bottom of the gutters along the sides of the existing platforms and backfilling with new concrete. Then the surface of the old pavement was scarified and given a ¾-in. topping of Emeri-Crete flooring.

The flush-type hydrant was preferred to the post type for use at this location because it offers no impediment to the use of portable coach-servicing equipment. The service hoses are moved from one location to another on wheeled reels. The hoses have 6-in. metal disks at both ends to reduce the possibility of drinking-water contamination.

This work was carried out under the general direction of O. E. Hager, engineer bridges and structures of the Pere Marquette district of the Chesapeake & Ohio, who has general supervision of such work on the Fort Street Union Depot, and under the direct supervision of Frank B. Manning, division engineer.

This approach to its Arkansas River bridge is typical of Missouri Pacific's present standard construction for concrete trestles

How Concrete Trestles Are Precast and Erected on the M.P.

By replacing its timber trestles, whenever they come up for renewal, with ballasted-deck reinforced concrete trestles, the Missouri Pacific has more than doubled the service life of these structures. And by casting its own deck slabs and concrete piling, the railroad is building concrete trestles at a cost of only five per cent more than creosoted ballasted-deck timber trestles

• Since about 1925, the Missouri Pacific has been following the practice of replacing its wood trestles on certain heavy-traffic lines, whenever these structures come up for renewal, with ballasted-deck reinforced-concrete trestles. Through this practice, the lives of these structures are extended from an average of from 20 to 25 years for ballasted-deck creosoted timber trestles to an expected life of from 50 to 65 years for the reinforced-concrete trestles. Further savings have been effected since 1932 when the standard bent design was changed from six 16-in. concrete piles to three 24-in. piles thus considerably reducing the amount of pile driving work and the shifting of the existing deck when driving the concrete piles.

All reinforced-concrete deck slabs (both for single and double track structures), piling, backwall plank and cribbing are precast at the railroad's concrete products yard at North Little Rock, Ark. The piles are driven and the structures erected by system bridge gangs.

The concrete products yard is an extensive area which is divided into two main sections—one for casting and the other for storage—with yard tracks and a 40-ton locomotive crane serving both sections. The casting section is divided into two parts by two tracks, one part being used for casting deck slabs and the other for piles, backwall plank and cribbing.

One end of the casting section is utilized for the storage and assembling, in so far as possible, of the reinforcing steel. This material for the most part is already bent to the desired shapes when received at the yard, but some of it is in straight, standard lengths, and an electric bar-bender is provided for making bends to suit special conditions. Time is saved and accuracy is gained by assembling the reinforcing in the open and having the locomotive crane pick up the wired assemblies and place them in the forms. Reinforcing for the piles is inserted at one end of the octagonal forms and pushed longitudinally into place by a wriggling motion.

Concrete mixtures, made to specifications designated by the railroad, are delivered to the yard by trucks of a firm in Little Rock supplying ready-mixed concrete. The concrete is designed to develop a minimum strength of 3500 p.s.i. in 28 days. In general, a 7-bag mix is used for the piling, while a 6-bag mix is used for the slabs, backwall plank, and cribbing. The aggregates consist of crushed trap rock and river sand.

Trucks carrying concrete for the slabs are driven onto an elevated timber dock built along a concrete casting apron at ground level on which the forms are placed. The mix is dumped into a hopper and then transported to forms in concrete carts. When delivering concrete mixes for the piles, the trucks

are backed up onto a timber incline to discharge their loads into a large hopper. Two-wheeled concrete carts of 6 cu. ft. capacity deliver the concrete from the hopper to the smaller forms. A short-coupled electric vibrator is used to consolidate the concrete in the slab forms, and a flexible-shaft vibrator is used for that in the forms for the piling and backwall plank.

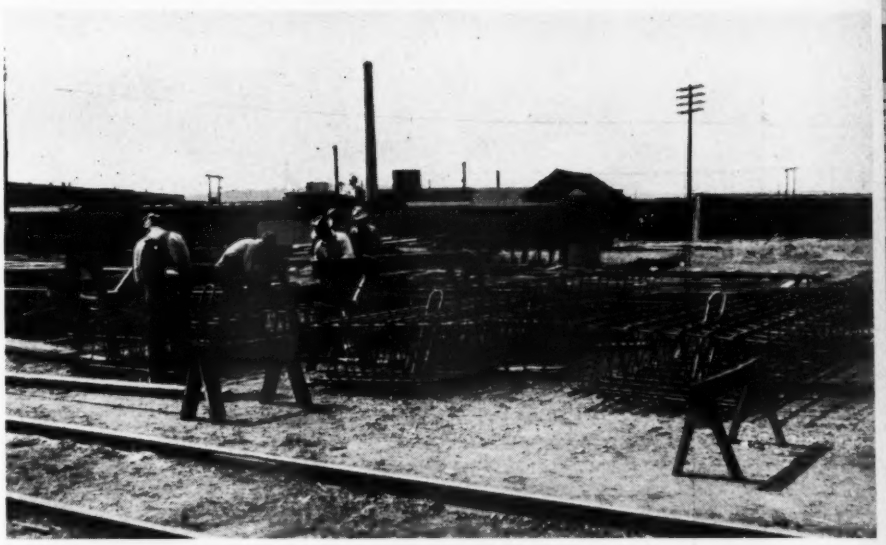
Three casting aprons, made of concrete that has been finished to a smooth, level surface, are provided in this yard. The surfaces of all aprons are kept oiled to permit casting concrete directly upon them. One apron, approximately 16 ft. by 225 ft. in size, is used for casting the deck slabs; a larger one, about 50 ft. by 150 ft. in size, is used for casting the piles; and a smaller one is used for casting backwall plank and cribbing. The pile-casting apron has a series of 4-in. by 8-in. timber headers embedded in straight lines, about 3 ft. 4 in. apart, in the concrete to facilitate the setting up of the forms by nailing.

Demountable steel forms, capable of being adjusted for various lengths, are used for all shapes. These forms are stripped from the castings at the end of 24 to 48 hr. and are cleaned and oiled before re-use. The concrete castings are covered with burlap on which water is sprinkled at intervals during the early curing. The piles are cured for three days and the deck slabs for five days before they are picked up by the locomotive crane and moved to the storage area for further curing. They are not used until the 28-day curing period has elapsed.

Lengths and Widths

The deck slabs generally are cast in lengths of 18 ft. and, for convenient handling, in half widths. Each slab is 2 ft. 5 in. thick at the edge along the centerline of track. From this edge the top surface slopes down 1 in. in 5 ft. 6 in. to a ballast parapet wall. A weep hole is cast vertically just inside the midpoint of the parapet wall and drainage is led to it by a gutter indentation made parallel with the parapet. All corners of the concrete castings are chamfered, and depression grooves are formed in the top surfaces around the contiguous sides so that asphalt plank can be inserted during erection to seal the construction joints. Be-

Steps in casting the deck slabs . . .

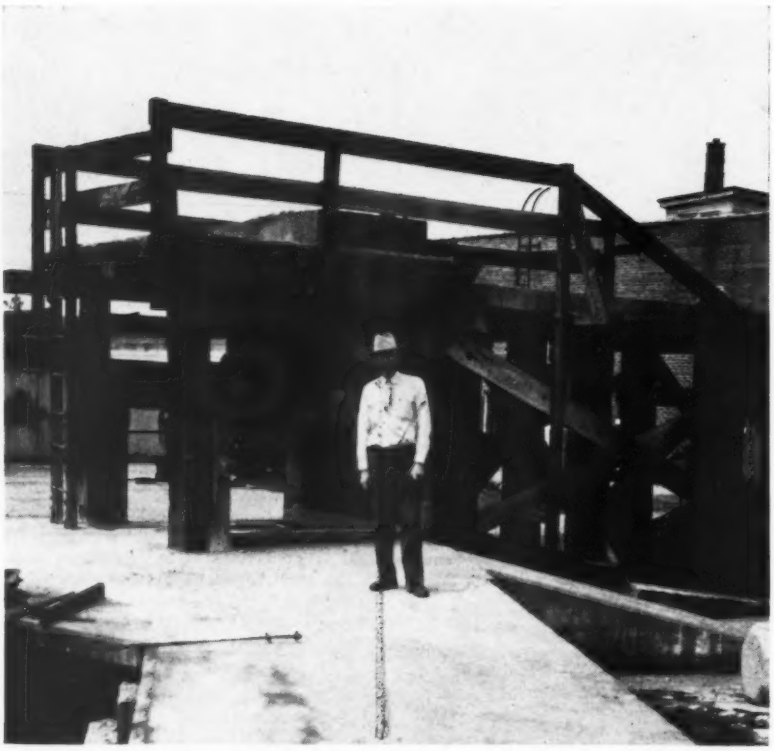


In so far as is possible, the reinforcing steel for the slabs is assembled in complete units in the open and then lifted into the steel forms by a locomotive crane

In the picture above the assembled reinforcing units have been suspended and blocked into correct position in the forms, and the sidewall reinforcing has been added

Below—Although the steel forms are stripped from the deck slabs the day after they are poured, the slabs are cured for five days before being moved by a locomotive crane to the storage area for further curing. The total curing time is 28 days

Casting of piles involves use of . . .



P. L. Garland, who is in charge of the precasting yard at North Little Rock, Ark., standing in front of incline and hopper in which ready-mixed concrete is delivered

A few of the steel forms which are used in casting the 24-in. (short diameter) octagonal concrete piles. The forms at the right center are used for casting the tapered end sections while those at the left are used in multiples to form the shafts

fore moving to the storage area, the top and ends of each slab are painted with a bituminous coating.

The piles are cast in lengths of from 20 to 60 ft. in increments of 5 ft. The pile shafts are straight, octagonal in section, and 2 ft. across the short diameter, while the points are 6 ft. long tapering to 9 in. Great care is exercised when setting up the forms to assure the casting of straight shafts. The length of each pile and the date it was cast is painted on the butt-end before being moved to the storage area.

The backwall plank and cribbing are not part of the reinforced-concrete trestle design, but they are cast in multiple forms whenever concrete is left over after the slab and piling forms have been filled. The backwall planks are used for constructing bulkheads at ends of timber trestles.

Field Erection

The system bridge gangs that erect the ballasted concrete trestles are equipped with 40-ton locomotive cranes, standard single-acting steam hammers, concrete-mixer cars, 105 cu. ft. air compressors, air tools, and other necessary tools and materials. Piles are ordered to lengths determined either by historical records of the structure or, if these are in question, by driving test piles.

The three-pile bents are driven with one pile at the center of the track flanked by piles driven vertically at 5-ft. centers on each side. These large concrete piles are driven as easily as wood piles by the steam hammer, which weighs approximately 10 tons and which is suspended from the boom of the crane. The ram of the hammer weighs 9,300 lb. and is activated by steam supplied by the crane. A driving head with a fir cushion block is used to prevent the shattering of the tops when driving.

When the three piles have been driven, they are cut off by air tools about 6 ft. 5 in. below the base of rail, at which level they will project about 9 in. into a field-cast reinforced concrete cap. The reinforcing of the piles is cut off with an oxyacetylene torch about 1 ft. 6 in. higher than the pile top for obtaining a good bond with the cap. Forms for the caps are then built, reinforcing steel is placed, and concrete is poured from the mixer car.

Caps are made 3 ft. wide, 3 ft. 6 in. deep and 15 ft. long. The top

of each cap is leveled off at 3 ft. 8 in. below the proposed base of rail with the result that, allowing for the thickness of the deck slab, there is a depth 7 in. to 8 in. beneath the ties for ballast. The caps are constructed with rounded noses at each end.

Method of Bracing

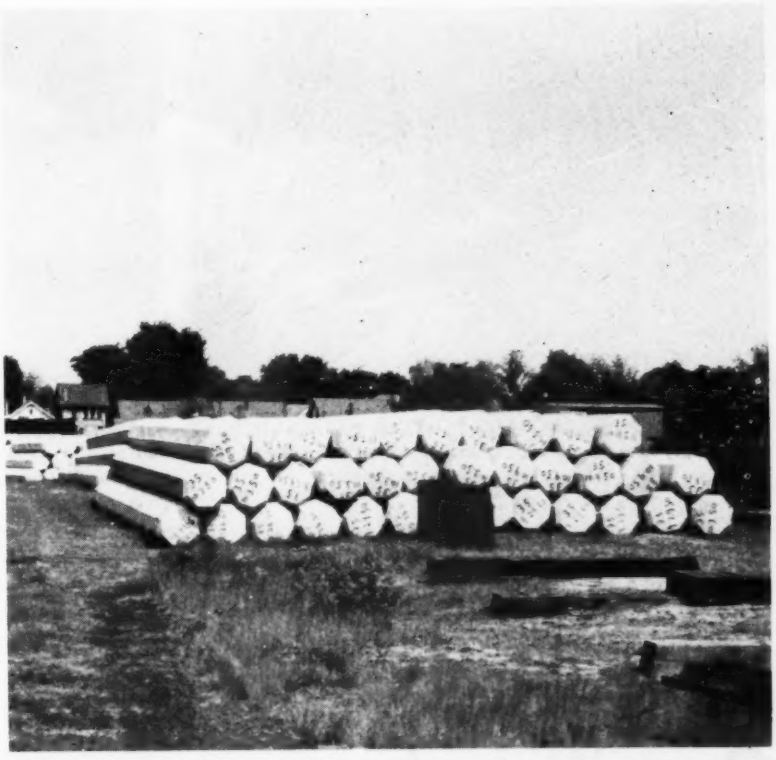
No longitudinal bracing is used, but where measures are necessary to prevent longitudinal movement of the bridge, anchor bents are driven at intervals of 8 to 10 panels depending upon the height of the bents. An anchor bent consists of two lines of piles, driven 3 ft. apart, capped by a reinforced, monolithically-poured cap, 6 ft. wide. An integrally-cast wall, 2 ft. wide and 2 ft. 5 in. high, projects above the cap seat to receive the end thrust from the slabs. At bents where height from base of rail to ground exceed 18 ft. a reinforced concrete collar is poured encasing the piles. The top of the collar is placed at the ground line.

When the bents and abutments have been constructed and sufficiently cured, the locomotive crane is used to remove the track and the existing timber structure and to place the precast concrete deck slabs. A ¼-in. premolded filler is placed between the ends of abutting slabs during erection. When the slabs have been properly aligned on the caps, they are fixed in that position by grouting between the side of the slab and a 3-in. shoulder on that portion of the cap tops that projects beyond the bases of the slabs. Where the slabs adjoin the abutments or open-deck construction, as on a steel span, the end deck slabs are each cast with a retainer wall at one end to prevent the ballast from spilling out.

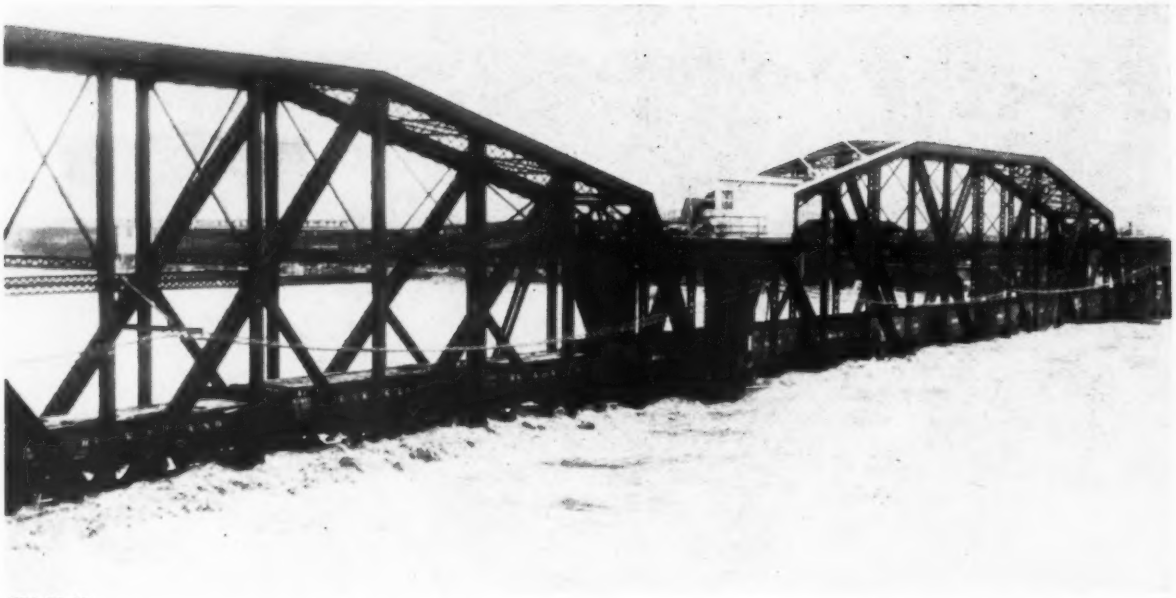
The backwalls are cast integrally with the caps of the end bents. They are so shaped that they conform with the lower perimeters of the two end slabs, thereby eliminating the need for backwall planking.

Before application of the ballast, all joints of the deck slabs are covered by a 1-in. by 8-in. asphalt planks laid flat in the precast grooves mentioned previously. These planks are placed over a layer of two-ply membrane waterproofing sealed to the concrete with plastic cement. The ballast is then placed on the deck slabs and the track rebuilt.

The concrete piles are cast directly on the oiled surface of a concrete apron which forms one of the eight sides. After pouring, the castings are covered with burlap



Before the precast piles are moved to the storage yard by a locomotive crane, the length of each pile and the date it was cast are painted on its top end. None of the piles are shipped out until they have cured for a period of at least 28 days



(Wide World)

Loaded gondola cars ballasted the Rock Island's Kaw River bridge near Armourdale (Kan.) on July 13. Swift movement of the water caused a foaming "rapids" over the deck. It was on this day that the Armourdale industrial district became flooded

(Acme Telephoto)

The Burlington's Hannibal bridge in Kansas City was struck by three empty river barges and the movable span was jammed open

(Wide World)

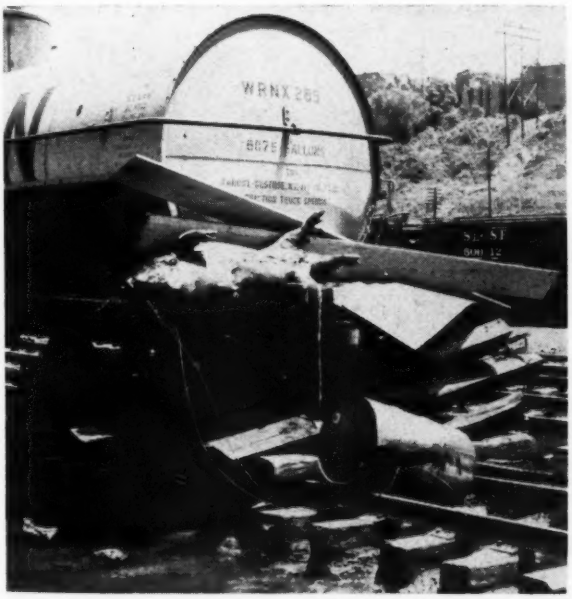
Santa Fe's roundhouse at Kansas City. A broken levee flooded this area in 30 minutes, leaving no time to remove equipment

Record Floods Hit Railroads Hard Over Wide Area

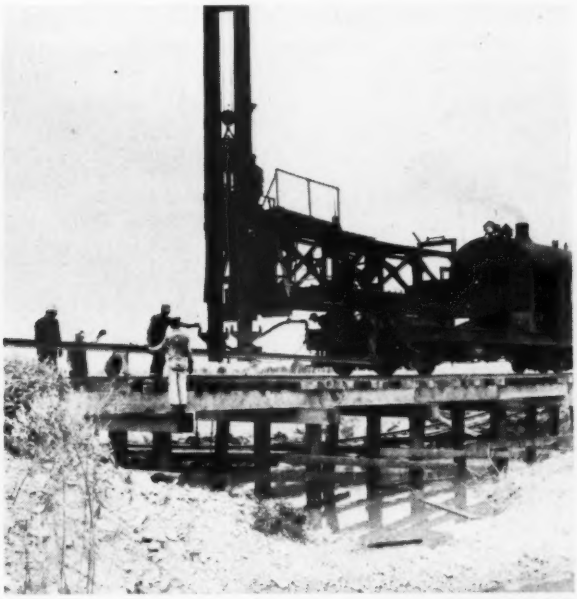
• The great Kansas-Missouri flood, which occurred in mid-July, is now history, but the havoc it left in its wake is still not totally repaired and, what's more, it will doubtless be many years before the memory of their experiences will be erased from the minds of the railroad men who supervised the repair work. The task was a monumental one and very costly. In fact, the total cost of the flood damage to industrial, commercial, public and private property (including losses from interruption to business) is estimated to be in the neighborhood of $2 billion—much greater than the cost of the disastrous 1927 and 1937 floods of the Ohio and

Water from Kaw river rushed through breach in flood wall at right, washing out this Missouri Pacific track at Kansas City

Missouri Pacific freighthouse at Kansas City as flood waters were receding. Portion of platform (upper left) had collapsed



Victim of Kansas City flood was this hog, whose carcass, along with other debris, was stopped by a tank car in Frisco yards



Bridging a washout on the Katy near Simpson, Mo. The Katy tracks in this vicinity serve as a levee for Missouri river

Mississippi rivers. Of the transportation agencies involved, the railroads suffered the heaviest damage. Just what some of them were up against in the Kansas City area and in other parts of Kansas and Missouri when the flood waters had receded is strikingly illustrated in the photographs reproduced on these and the following pages.

It all started when extremely heavy rains fell early in July on the already water-soaked watersheds of the Kaw river (or Kansas river as it is also known), its tributaries, and other streams in Kansas. As a result, the Kaw river rose to an all-time high level. Starting July 11 at Manhattan, Kan., the flood crest rolled down past Topeka, Lawrence and into the Missouri river at Kansas City where its wild three-day rampage came to a climax on July 14. All the low-lying industrial areas in both Kansas City, Kan., and Kansas City, Mo., went under water despite the system of flood walls and levees that had been built there over the years.

It was in the flooded Kansas City areas that the railroads sustained their greatest damage. Covered with water, in places to a depth of 22 ft., were the big Argentine (Kan.) terminal of the Atchison, Topeka & Santa Fe, the Armourdale (Kan.) yard of the Chicago, Rock

Floods caused heavy damage on Frisco...

Working in the receding flood waters, this Frisco district gang is shown repairing badly damaged track near Miami, Okla.

The remains of the carpenter shop and other wooden structures made the Frisco yards at Kansas City look like a lumber yard

Installed less than a month before, Frisco's car washer (foreground) got a washing itself. In background are coach yards

After the flood, cleaning gangs faced the big task of removing silt. Here workmen are scrubbing the superintendent's office

Island & Pacific, the Henning Street yard and freight-house of the Kansas City Southern, and yard tracks and other facilities of the Wabash, the Missouri Pacific, the Missouri-Kansas-Texas, the Gulf, Mobile & Ohio, and the St. Louis-San Francisco.

Silt Posed Tough Problems

One of the biggest and toughest jobs in these locations after the water had receded was the removal of silt, which in some cases had completely buried yard tracks and invaded freighthouses and other buildings to depths of as much as 12 in. Equipment such as bulldozers, power shovels and yard-cleaning machines played an important part in this task.

Practically all the railroads mentioned above also experienced serious service interruptions due to washouts which occurred in Missouri and as far west as Central Kansas. For example, some 2300 ft. of line on the Katy between St. Charles, Mo., and Machens was completely destroyed by the Missouri river. At one location on this stretch of track the river left a hole

...and gouged "big hole" on Katy

One of the worst spots on the Katy after the flood was the so-called "big hole", made by the Missouri at St. Charles, Mo.

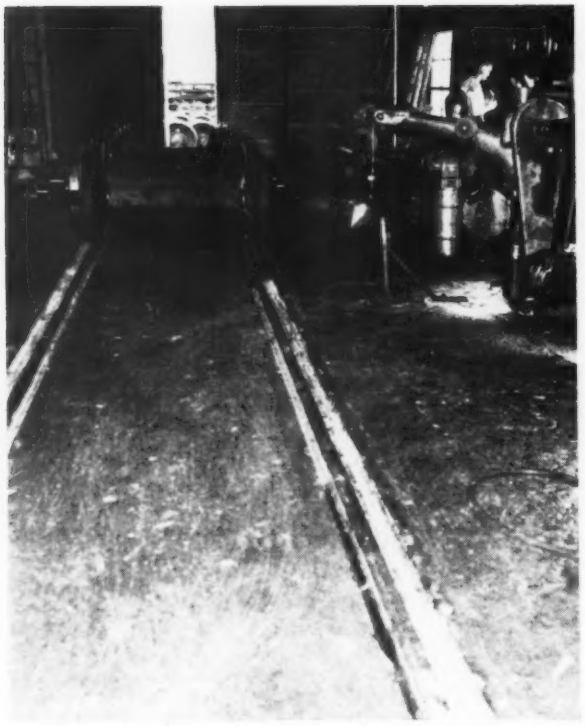
Above—Between St. Charles and Machens, where the Katy's embankment serves as a levee, the line was cut at many locations

Below—Another view of the "big hole". The hole was 860 ft. in length and a phenomenal 67 ft. in depth below track level

Restoration work along this stretch of track was under way immediately after the high water in the Missouri had receded

860 ft. long and about 67 ft. deep below the track level.

Much of the Santa Fe's line between Kansas City and Topeka, which is in the Kaw River valley, was under water and badly damaged. Transcontinental service on the Santa Fe was suspended for 10 days. Serious damage was also suffered on the Santa Fe's lines west from Topeka to Newton, Kan., and Wichita; by the line of the Wabash between St. Louis, Mo., and Kansas City; the low-level "river freight line" of the Missouri Pacific between St. Louis and Kansas City; and the line of the Frisco at Cape Girardeau, Mo.



Armored with a steel grating and surfaced with a tough, plastic material, this car-wheel-shop floor on the T. P. & W. shows no sign of deterioration whatever after more than a year of service

Because of the floor's surface plasticity, the car wheels, as they are rolled over the floor, form slight, "self-healing" grooves which help to keep the wheels from slipping sideways

How to Make

A Long-Wearing Floor for Car-Wheel Shops

• Because of the severe treatment to which they are subjected, floors in car-wheel shops must be unusually rugged and durable if excessive maintenance costs or early replacement are to be avoided. The Toledo, Peoria & Western has installed, in a small car-wheel shop at its East Peoria (Ill.) yard, a new type of floor which, the road believes, has these qualities in a degree greater than any type it has ever tried before.

The new floor, 24 ft. by 60 ft. in plan, consists of a reinforced concrete slab, 5 in. thick, topped with a steel grating, 1 in. thick, the openings in which are filled with a tough, plastic material commonly used for resurfacing or patching floors. This floor, which was constructed to replace a worn-out plank floor, has now been in service more than a year, and as yet has shown no sign of deterioration whatever, even in those areas subjected to the most frequent travel of the car wheels.

The grating, a heavy-duty floor-armoring material known as Hexteel, is fastened to the underlying concrete slab by anchor bolts, and its top surface is covered by the resurfacing material to a depth of about ¼ in. The resurfacing material is a product known as Ruggedwear.

Other Features of Floor

The road has found that the new type of floor construction is not only more durable than wood or concrete floors, but also easier and safer to work on. Because of the plasticity of the surfacing material, the floor is reported to be resilient and therefore less fatiguing to stand or walk on all day than harder materials. Also, because of the floor's surface plasticity, the car wheels, as they are rolled over the floor, form slight grooves which help to keep the wheels from slipping sideways. These grooves are "self healing" and have no deleterious effect on the surface of the floor.

The cost of the floor is somewhat greater than that of a conventional reinforced concrete floor. It is believed, however, that its low maintenance cost and greater life expectancy makes the greater cost worthwhile. The road plans soon to replace a timber wheel-storage platform adjacent to the shop with the same type of construction.

The wheel-shop floor described above was designed and constructed under the supervision of H. H. Main, chief engineer of the T. P. & W., and R. H. Egbert, assistant chief engineer.

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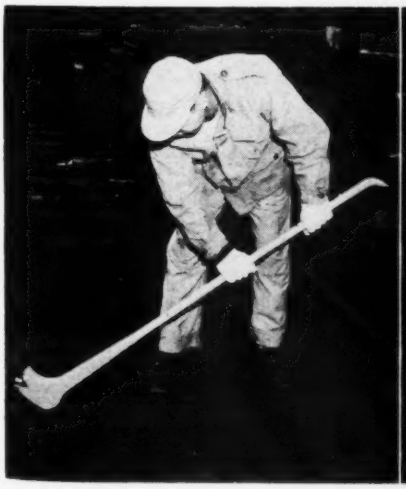
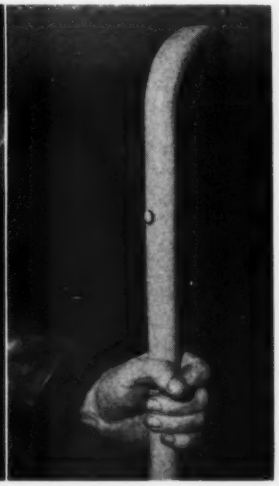
After the spike is loosened and lifted about 2½" with the lower jaws of the tool, the upper jaws are applied for the final complete removal of the spike from the tie, without "heeling".

The safety marker indicates the area of the handle to be gripped so that hand injuries cannot occur by pinching against far rail.





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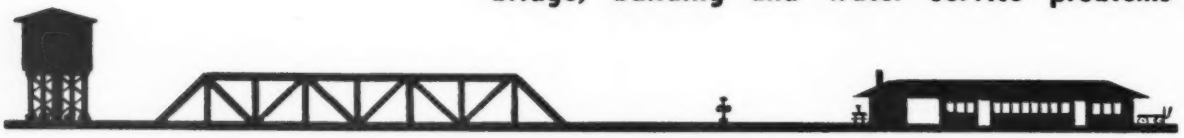

Why Shift Ties to Paint Bridge Steel?

In painting open-deck steel bridges, should the ties be removed or shifted in order to clean and paint those portions of the stringers or girders which come into direct contact with the ties? Explain.

Paint When Deck Is Renewed

By J. P. Dunnagan
Engineer of Bridges, Southern Pacific, San Francisco, Cal.

We follow the practice of painting the top flanges of stringers of steel bridges only at the time the deck is renewed. As a panel of ties are removed in preparation for installing the new ties, the top flanges are thoroughly cleaned and given a coating of red-lead paint immediately in advance of placing the new ties.

I have never noticed serious deterioration of the top flanges where it has been covered by ties and I believe that loosening up the deck to shift ties would do more harm than good because the deck always receives some injury during such work. The space between the ties can be cleaned and painted as needed.

Rust Preventives Help

By F. H. Cramer
Bridge Engineer, Chicago, Burlington & Quincy, Chicago

To clean and paint properly those portions of stringers directly under the ties, the ties must be shifted or removed. To do this the track spikes must be removed and the plates rehandled. To accomplish a preferred job of cleaning and to gain some time, several ties should be shifted. This can only be done between trains. Sufficient time is also necessary for putting the ties back into position before trains are allowed to operate, particularly at high speed.

It may be said that the rail and ties could be jacked sufficiently so that the cleaning and painting can be done, but this requires the removing of all tie fastenings and the raising of the track at the ends of the bridge in some manner. This is double trouble in that the track off the ends of the bridge must later be lowered to its original gradient.

Such difficulties have led to the usual practice of cleaning the flanges of stringers and girders between the ties with a chipping hammer and long chisels. This, of course, does not remove any rust that may lie directly under the ties. If rust exists, it cannot be removed until the ties are renewed. At that time the steel is given a good cleaning and painting.

We find, in our practice, that NO-OX-ID is a good preservative and if used between the ties will penetrate fairly well under them during hot weather.

No Use to Paint Under Ties

By S. F. Grear
Assistant Engineer of Bridges, Illinois Central, Chicago

In my opinion, the results obtained by moving ties do not justify the labor and expense of doing it. Ties, ordinarily, are fastened to the steel by hook bolts or similar methods and they are held in place

(Continued on page 828)

Answers to the following questions are solicited from readers. They should be addressed to the What's the Answer editor, *Railway Engineering and Maintenance*, 79 W. Monroe St., Chicago 3, and reach him at least 30 days in advance of the issue in which they are to appear. An honorarium will be given for each published answer on the basis of its substance and length. Answers will appear with or without the name and title of the author, as may be requested. The editor will also welcome any questions which you may wish to have discussed.

Two be Answered In the November Issue

1. What are the advantages and disadvantages of designing ballast cars as multiple-purpose units, suitable for revenue service as well as m/w use? Explain.

2. How can wood freighthouse floors be economically adapted to give satisfactory service where lift trucks and other wheel-mounted equipment have been introduced? Explain.

3. Where fork-lift trucks and similar types of freight-handling equipment must be operated over tracks in paved surfaces, such as on piers, what are the relative advantages of T-rail and girder-rail construction? Explain.

4. To what extent are automotive house trailers adaptable to use by bridge and building forces in place of camp cars? What are their advantages, if any, for this purpose?

5. What are some of the best ways of facilitating the starting of diesel engines on tractors and other roadway machines in extremely cold weather? What other aids are available for this purpose? Explain.

6. Under what conditions is it desirable to use mobile equipment for fueling and sanding diesel locomotives? What general characteristics should be possessed by such servicing units?

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152-23

longitudinally by tie spacers. This makes it difficult to jack up the track or move the ties. When ties are moved to permit putting paint under them, it is, of course, necessary to replace them on the fresh paint almost immediately. The fresh paint on which they are placed is almost sure to be broken by movement of the tie.

The worst corrosion on stringers or girders usually comes directly under the tie. Hence, this is the place that should be protected above all others. But in many years of experience, we have not found any satisfactory way of protecting this surface. Although it is necessary to replace, at a very high cost, the top parts of the stringers or girders when a certain point of deterioration is reached, I would not recommend spending the money and labor to attempt to get paint under ties which have already been placed and fastened down.

On the other hand, the tops of new stringers or girders should have three coats of paint, well dried, before being placed.

Suit Practice to Conditions

By R. E. Peck

Bridge Engineer, Missouri Pacific, St. Louis, Mo.

On some railroads it is the practice to clean and paint the steel flange surfaces only between the ties, because the ties themselves afford protection to the surfaces which they cover. Furthermore, these surfaces are kept clean by the abrasive action produced by the working of the deck under traffic.

In many cases the surfaces covered by the ties are relatively clean and free from deterioration, while the exposed surfaces between ties have deteriorated considerably. In many other instances, however, the greater deterioration has occurred under the ties. This last condition is more pronounced where asphaltic fillers or similar protective materials have been applied to the flanges between ties because the fillers shrink away from the vertical faces of the ties and leave crevices which retain brine drippings and permit them to seep under the tie.

In view of the uncertainty as to the physical condition of the flange areas covered by the ties, the entire top surface of the stringer or girder flange should be cleaned and painted. This can be done by removing the hook bolts and jacking up the deck, a section at a time, to provide working clearance.

In territories where brine drippings are extensive, metallizing the top surfaces and edges of the upper flanges of floorbeams and stringers not only minimizes corrosion but precludes the necessity of painting the areas whether under ties or not.

Movement Keeps Steel Bright

By George S. Crites

Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

Density of traffic over the bridge to be painted will largely determine whether or not the portions of the stringers or girders which come into direct contact with the ties should or should not be painted.

Where traffic is heavy, ties are kept pressed snugly onto their bearings to keep the bearing surfaces polished. On heavy-traffic lines, ties are kept solid enough to keep moisture and corrosives away from their bearings. Any paint on such bearing places soon becomes a part of the ties and does no good to the metal underneath.

Light-traffic lines may not have such favorable conditions for preserving tie bearings. Ties may not be kept solid enough to keep moisture and corrosives from under them and their movements may not be enough to keep the bearings polished. When painting bridges where such conditions might obtain, the deck hold-down devices should be loosened and the deck raised enough to allow thorough cleaning and painting of the entire upper surfaces of stringers or girders on which ties rest. A sand-blast outfit will clean the surface quickly and well, and a paint spray outfit will cover the bearing surfaces with the minimum lifting of decks.

How to Space Insulated Joints

Should insulated joints be installed opposite each other or should they be staggered? Why? If staggered, what factors govern their spacing? What is the maximum and minimum spacing permissible? Why?

Maximum Stagger is 35 Ft.

By A. L. Essman

Chief Signal Engineer, Chicago, Burlington & Quincy, Chicago

In my opinion, no set rule governs whether or not insulated joints should be installed opposite each other or staggered. Track maintenance men have advocated that there are certain benefits to be derived from having other joints staggered, and it would appear that the same benefits should apply to insulated joints. Therefore, wherever the signal people can arrange their systems to permit the staggering of joints, I think the practice of staggering should continue. Furthermore, I think the only factor that governs the maximum staggering of joints is Rule 136.55 of the Interstate Commerce Commission Rules, Standards and Instructions for the Installation, Inspection, Maintenance and Repair of Various Signal Systems. This rule reads, "Dead section—maximum length. Where dead section exceeds 35 ft., special circuit shall be installed. Where shortest outer wheel base of a locomotive operating over such dead section is less than 35 ft., the maximum length of the dead section shall not exceed the length of the outer wheel base of such locomotive unless special circuit is used." It must be remembered that a track circuit is only effective whereby a current can flow from one rail through a wheel, an axle, and another wheel to the opposite rail. It can readily be seen that when a pair of wheels is located between insulated joints the track circuit is not effective and hence the space between the joints becomes, in effect, a dead section.

It is desirable in territories where switches or derails are operated either electrically or mechanically, that the locking circuit for such switches become effective at the signal governing movements

(Continued on page 830)

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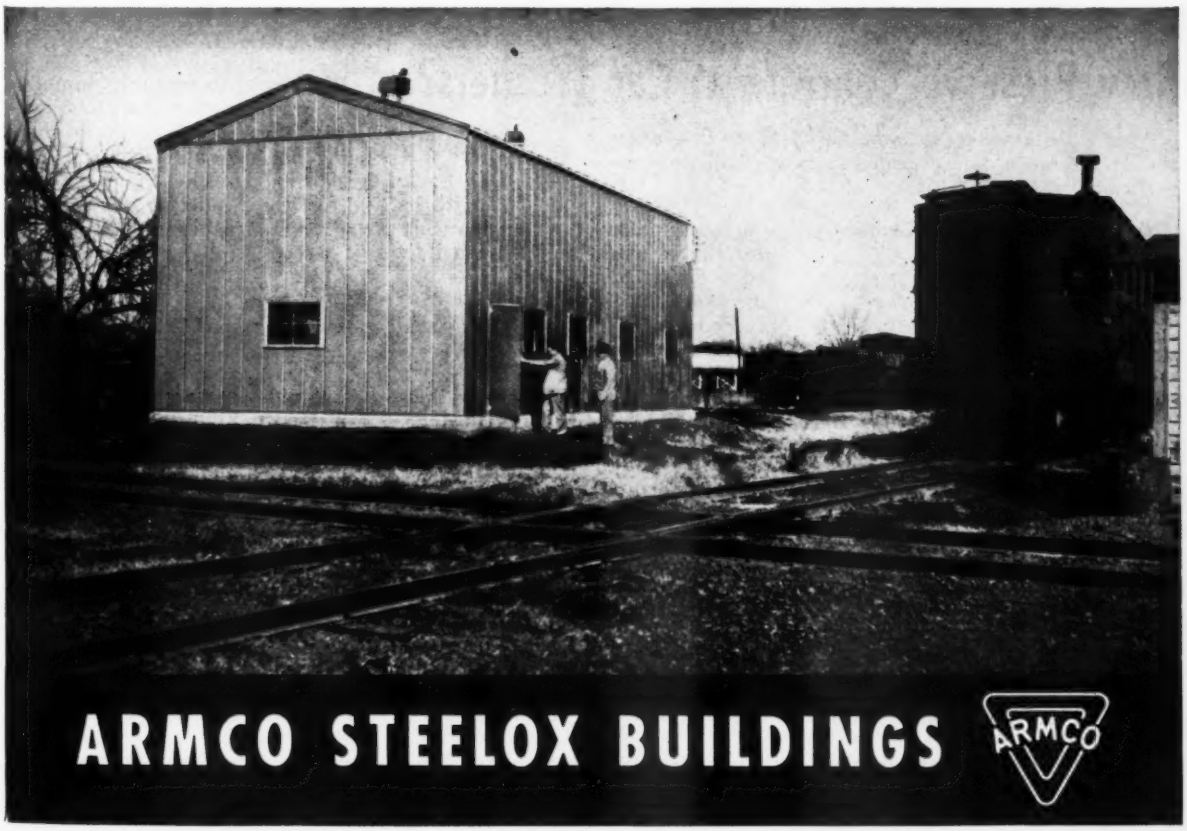

over such switches or derails. Therefore, in connection with new installations, we endeavor to have one of the insulated joints directly opposite the governing signal, letting the insulated joint on the other rail fall a little greater distance from the switch or derail. This permits the locking section to become effective at the signal and at the same time permits staggering of the joints. However, at some interlockings switches are relatively close together. With signals installed between these close switches, the insulated joints must be placed directly opposite each other.

Shrinking Water Treating Facilities

Where there has been a considerable reduction in the quantity of water required for steam locomotives because of dieselization, what changes or alterations can be made in water-treating plants or practices to minimize costs? Explain.

Three Basic Plans Adopted

By B. S. Snow
President, T. W. Snow Construction Company, Chicago

To answer this question we herewith summarize the methods used at locations to shrink the facilities formerly used for preparing the boiler water when all the locomotives were steam, to meet the conditions now present when most of them are diesel. Depending on local conditions, one of the three following schemes can be used to advantage.

(1) The track service tank, if not new, can be retired and the top of the treating tank can be used for storage if the distance between the tanks is not too great. The treating plant and its equipment can then be remodeled to make them fully automatic. This will increase the supply of treated water, will reduce maintenance and minimize freezing troubles during periods of cold weather. Payroll savings from such modernization will often equal or exceed in the first year the entire cost of remodeling the plant.

(2) If the treating plant and buildings are in bad condition, they can be retired and replaced by building a small treating plant into the service tank if it is in good condition. Nearby buildings can be used to house the equipment. If suitable buildings are neither serviceable nor available, a small compact structure will have to be built close to the service tank.

(3) If the use of water is very light, the best thing to do is to retire all facilities and install a 4-in. or 6-in. water crane that will operate on high pressure city mains. Special care must be exercised in planning this type of facility to assure that the closure of the valve does not create surges in the city main. Standard gate valves are not always sufficient for this service, but special diaphram valves operating on a hydraulic-balance principle of control are available for this use.

How Preserve Concrete at Car Washers?

What is the best way to overcome the destructive effect of soap, detergents or acids on the concrete aprons provided at car washers?

Use Steel-Aggregate Cement

By A. L. Becker
Engineer of Structures, Missouri Pacific, St. Louis, Mo.

In the Fall of 1948 a car-washing plant was constructed at St. Louis, Mo., in our passenger yard, which is jointly owned and operated by the Missouri Pacific and the Pennsylvania. In less than a year the surface of the concrete platforms or aprons was becoming badly pitted and deteriorated. Investigation disclosed that this was caused by the acid detergents used in washing the cars.

We contacted a number of railroads having similar washing platforms and found that they were experiencing the same trouble. One railroad had used a corrective treatment which they advised had not been in service a sufficient length of time to reach a definite conclusion as to possible service life, but which they felt would prove effective. On the basis of information from that railroad we decided to follow the same corrective measures.

In the summer of 1949 the entire surface of the concrete at the washing platforms was roughened with chipping hammers. It was then cleaned and a brush coat of a special-type cement, of paint consistency, containing fine steel aggregate, was applied. This was followed by an application of a stiff mix of the same type of concrete from ½ in. to ¾ in. thick, troweled to a smooth surface. When the resurfacing was completed it was coated with acid-resisting paint by brush application. It has been approximately two years since these corrective measures were taken and so far they appear to be effective.

We have subsequently completed a washing platform at Osawatomie, Kan., the wearing surface being finished with the same materials and in the same manner. So far, the results of this installation have also been satisfactory.

Acid Cleaners Cause Damage

By Sterling E. Killebrew
Manager, Railway Service Division, Oakite Products, Inc., New York

This question of damage to the concrete foundation and slabs around automatic car scrubbing equipment has come to our attention on numerous occasions and, to give you some idea of the type of cleaning materials used on the exteriors of cars and diesel locomotives, it has always been our standard recommendation to use an acidic type of material mixed with water, in concentrations of anywhere from 2 oz. up to 8 or 10 oz. per gal. of water, to remove the type of dirty film containing fine steel particles that accumulates on

high-speed passenger equipment. Periodically, equipment requires an alkaline type of material due to the presence of fresh oil, pin grease, etc.

The damage to the concrete can only be caused by the acidic type of material which definitely has a deteriorating effect on the lime content of the cement finish and structural concrete. Solutions of this material will decompose the lime content of the concrete, working from the top surface and gradually through the thickness of the slab if used for a number of years. To protect concrete against this type of deterioration we have found coatings comparable to heavy applications of paint to be ineffective because they do not offer lasting resistance to wear and damage from sharp objects. We recommend that the slab and foundations projecting above the slab be covered with approximately 1¼ to 1½ in. of an acid-alkali-proof mastic coating usually installed by contractors under the direction of representatives of Johns-Manville, Phillip Carey or other reputable manufacturers of this type of product.

Another method of protection which has proved satisfactory on railroads is the use of acid-alkali-proof tile assembled with an acid-alkali-proof joint material. Initially, this method costs considerably more than mastic.

Use Brick on Concrete Base

By Robert R. Pierce

Product Supervisor, Pennsylvania Salt Manufacturing Company, Philadelphia, Pa., and Chairman, Technical Practice Committee 6 K, National Association of Corrosion Engineers

The most effective method of overcoming the destructive influence of soap, and detergent or acid-type cleaners on the concrete aprons provided at railroad car washers, is the use of a protective layer of silica brick, laid on an asphalt-type barrier and bonded with cement that is resistant to acids and alkalies.

If soaps and detergents are the only types of cleaners used, the deleterious effect is insignificant, and adequate protection can be obtained by treating the concrete with admixtures of the calcium-chloride type.

Acid-type sulfates, on the other

(Continued on page 832)

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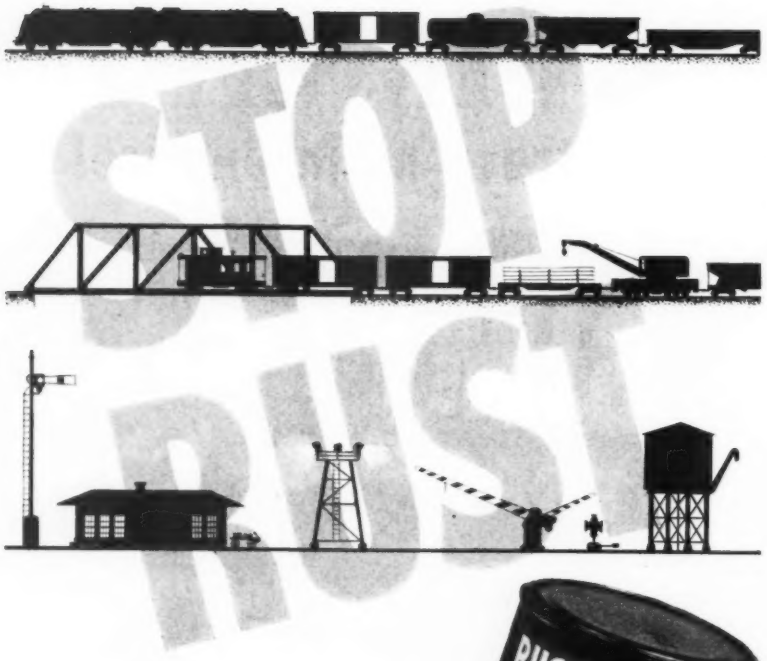

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What's the Answer? (Cont'd)

hand, are very corrosive, and disintegrate ordinary cement concrete by an action called "sulfation." Under certain conditions, concrete slabs have been known to disintegrate from this cause to a depth of ½ in. to 2 in. in a matter of months and to be destroyed in a very few years. Oxalic-acid cleaners, while not as corrosive as the acid sulfates, nevertheless should be handled in the same manner.

The corrosive influence of acids on concrete has also presented a problem to the chemical industry, particularly to the producers of acids and railroads might well benefit from their experience. There the difficulty has been overcome through the use of an impervious barrier—composed of oxidized asphalt compounds—which protects the concrete. The impervious barrier is, in turn, covered with a brick layer which not only prevents physical damage to the asphalt barrier, but provides a layer of insulation against the effects of hot steam, hot washing compounds and the weather. It also prevents oxidation or embrittlement and cracking of the asphalt layer which would result from contact with acid compounds.

The brick should be a good grade of acid-resisting brick, such as a hard-burned, high silica brick. These cements may be based on the fully modified phenolic or the furfural-alcohol resins. Ordinary cements, sulfur cements or silicate cements should not be used in this particular type of service.

Construction of a typical installation of this type would involve six basic steps. (1) A reinforced concrete base would be poured and the stop sloped to drains. (2) An acid-resistant bituminous compound would be spread on the clean, dry concrete. (3) Bituminous impregnated paper (heavy tar paper) or acid-resisting glass cloth should be laid over the compound while it is still tacky. If tar paper is used, it should be overlapped 6 in. If glass cloth is used a 4-in. overlap is allowed. (4) The bituminous compound is spread over the paper cloth. (5) Clean, dry, sharp-cut sand is sprinkled lightly over this compound while tacky. (6) The acid resisting brick is laid by buttering each on the bottom and two sides with corrosion-resistant cement mortar. The buttered brick is slipped or squeezed

into position to remove trapped air and bubbles. Excess acid-resistant cement mortar is cut off and two days are allowed for curing at 60 to 80 deg. F. Such construction has withstood 14 years of exposure to sulphuric acid spillage and fumes with little apparent effect.

Wherefores of Foremen's Meetings

Why, when and where should meetings of foremen be held? What considerations determine the best time and place for such meetings? If they are held during working hours, what provisions should be made for supervision of the gangs?

Hold Meetings in Field

By L. E. Donovan
Assistant Engineer, M. of W., Illinois Central, Chicago

For many years periodical meetings of foremen were held at some central location on each supervisor's district. The meetings were generally held to discuss safety matters and other subjects that the supervisor wished to impart to each foreman. To attend these meetings some men found it necessary to come great distances, and all foremen left their gangs without supervision. To make this possible, gangs were assigned to work in the vicinity of the section headquarters, or in some cases, were completely laid off.

Because of our increased traffic, higher speed of trains, the 40-hr. work week and the need for a high productive effort, our railroad is getting away from the periodical meetings among foremen. In their stead the supervisors, often accompanied by the division engineer in regular trips over the railroad, are periodically holding meetings where the gangs are working. In each case enough time is taken to hold what is considered a good meeting. In this manner it is felt that getting to the men what formerly was imparted only to the foremen is accomplishing more, and I am quite certain getting better results. In following such a plan it is gratifying to note the intense interest on the part of the

(Continued on page 834)

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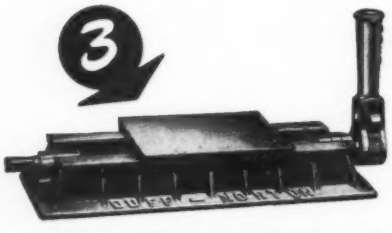

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What's the Answer? (Cont'd)

men as well as the foremen. While there is no question regarding the additional time this method requires on the part of the supervisory officers, our present-day requirements dictate this to be our only way to stimulate interest among our foremen and men. This form meeting eliminates all of the anxiety that formerly existed when foremen left their gangs without supervision.

Our only exceptions to meetings "on the ground" are those held for rules examinations which foremen must take. Such examinations are held quadrennially on our railroad, at which times we double up the gangs, bringing in half of the foremen on the first day and the remainder on the following day.

Meetings Aid Supervision

By Malcolm E. Condon

Construction Supervisor, Erie, Jersey City, N. J.

The importance of holding meetings of foremen periodically should not be minimized. This applies to meetings of track and signal foremen, as well as to those of bridge and building men. However, except for safety meetings, it is probably of greater advantage to keep the meetings of the three groups separate, unless large projects, involving more than one group, are to be considered.

These meetings have particular value in discussing common problems involving work programs, the utilization of work equipment, supply and distribution of material, labor situations, camp facilities, the transportation of men, material and equipment, and as briefing sessions for special projects for which a joint, coordinated plan of procedure must be established and a timetable of operations set up. For example, in cutting a new main track into service, track and signal forces and perhaps even bridge and building forces, all have specific assignments that have to be carried out as part of a master plan. The efforts of these groups can best be coordinated at a meeting held a day or so in advance of the in-service date.

The frequency of meetings should be determined by the specific conditions encountered. Regular meetings certainly should be

held just prior to the start of the work season to familiarize foremen with the program, the distribution of extra gangs, equipment, and material, and to settle any questions involving employment, transportation, working hours and similar problems which may be anticipated. Meetings for special projects are naturally set up as required. It is important to keep the frequency of meetings to a minimum during the working season, so that the absence of the attending foremen from their assigned jobs does not appreciably slow up the progress of such work. Naturally, the jobs, the gang organization and the conditions in the field are all variables to be considered in scheduling meetings and determining who should attend.

The site of the meeting place should be chosen wisely, taking into consideration transportation facilities available, the time the meeting is to start and end, and other factors. Adequate seating facilities should be available. Special conditions, as circumstances may dictate, should be analyzed. Normally the track supervisor's office, or one of the division offices is best suited for such meetings, since records, clerical assistance and other facilities are readily available. On the other hand, a geographically central point might be more advantageous, particularly if transportation, other than train service, must be utilized by the majority attending. In other words, consider the problems of those attending and make the arrangements for the convenience of the majority, to the greatest extent possible.

Safety or similar meetings involving employee welfare may be scheduled as dinner meetings on an annual, semi-annual, or quarterly basis. Other meetings must normally be held during regular working hours. This poses the problem of providing adequate supervision of gangs when foremen are attending such meetings. Where gangs have assistant foremen, there is little difficulty. When this is not the case, other expedients must be employed. One alternative is to double up gangs, with every other foreman attending the meeting. A second meeting can be scheduled immediately thereafter to accommodate those not attending the first meeting. Care should be exercised to be

(Continued on page 836)

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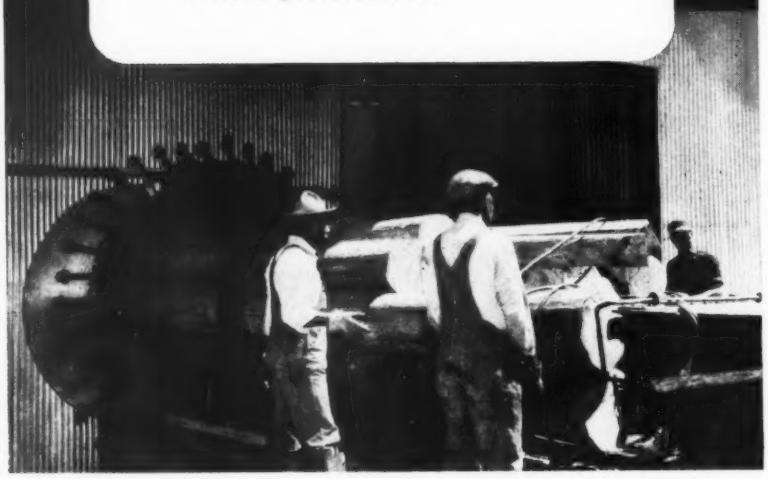

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What's the Answer? (Cont'd)

sure that gangs are not left without trained supervision at such times. The occurrence of an accident under such conditions could easily nullify the benefits of any meeting and prove of extreme detriment to all who were involved.

It is vitally important that the supervisor plan such meetings carefully, analyzing the conditions involved. He should develop a time, a place, and select an attendance list that will best meet the requirements with the least inconvenience to those attending. In this connection, the program of the meeting itself should be carefully planned, and every pertinent subject set up in an outline of procedure. If such a method is adopted the meeting will proceed smoothly and quickly, following a definite pattern that conserves the time of everyone. Under certain conditions, a mimeographed outline of the subjects to be discussed, and perhaps even a partial presentation of the problems, might be prepared. This could be distributed beforehand to permit those attending to give the subject matter prior study. Such action would naturally depend on the type of meeting and its objectives.

The objective of the meeting should be to present the subject matter clearly and concisely, to insure complete understanding on the part of those present. Definite solutions to the problems should be attained and definite conclusions reached. Such a meeting will yield the greatest possible benefits to those involved.

Keep Meetings Small

By George S. Crites
Division Engineer (Retired), Baltimore & Ohio, Baltimore, Md.

If rules, regulations and safety are on the agenda of foremen's meetings, it is well to limit the number in attendance to 20 or less and have the meetings at convenient locations for those who are to be interested. Few divisions, or sub-divisions thereof, have exactly the same problems regarding rules, regulations and safety measures. Hence, it is best, in so far as possible, to assemble those men who face about the same problems and then discuss only such problems.

When the sale of Government savings bonds, or some other pa-

triotic move or drive is on the agenda, the larger and snappier the meeting is, the better the results will be. Such meetings can be held in the evening, or on Sunday, providing short entertainment for the wives and children of the employees is arranged for.

At some meetings it is well to include entire gangs. For such meetings, the problem of gang supervision does not enter. When foremen and others who must be conversant with the rules and regulations are all that are desired at meetings, the remaining members of gangs should be detailed by their foremen to perform work that can be done without danger to themselves or to others.

What Type of Tires For M-W Trucks?

Should special types of tires be used on maintenance-of-way trucks which must be run on highways and also over rough terrain off the highways? Why? What types?

"All-Purpose" Tires Best

By C. L. Fero
Supervisor Work Equipment, Boston & Maine, East Cambridge, Mass.

The use of auto trucks by track and B&B forces for hauling men and material is increasing constantly. Because of the terrain over which those trucks often travel, the possibility of frequent tire damage and truck "down time" presents a serious problem.

Some railroads use a large number of heavy dump trucks on which tire life is comparatively short because of heavy loads and rough travel conditions. The same is true, to a lesser degree, of trucks equipped with other body types.

An analysis of tire troubles tends to indicate that the most damage is caused by the breakdown of the so-called backbone and sidewall of the tire from heavy impact received in driving over rough terrain, or coming into contact with rocks or other obstructions.

Tire manufacturers have long recognized the need for a more or less special tire for this class of service, and have marketed what they term an "all-purpose" tire made for combination on and off the road

(Continued on page 838)

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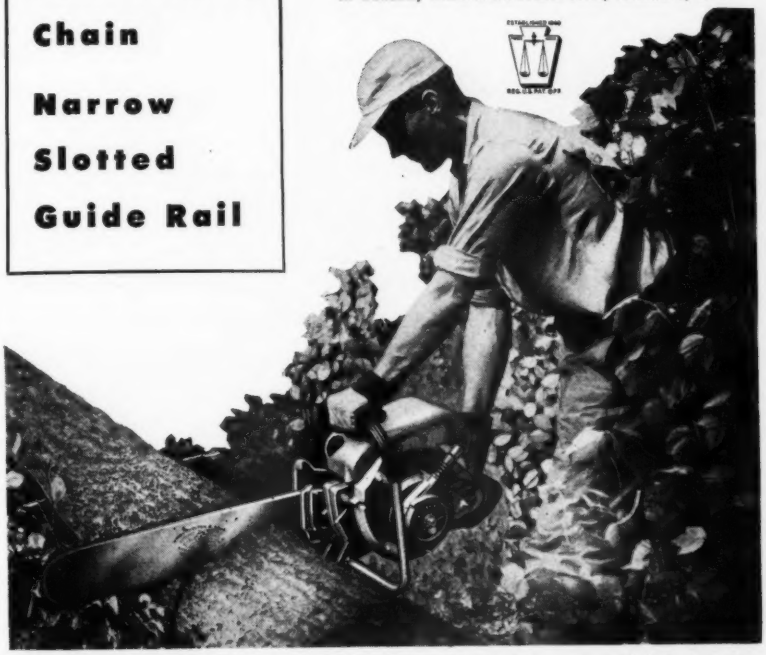

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What's the Answer? (Cont'd)

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Although these special tires cost about 10 per cent more than ordinary tires, the increased life due to less frequent tire breakdown and less "down-time" of trucks more than offsets the higher cost.

Ordinary Tires Sufficient

By H. W. Kellogg
Division Engineer, Pere Marquette District, Chesapeake & Ohio, Grand Rapids, Mich.

The manufacturers of various motor trucks equip them with tires which have been designed to carry the loads and fulfill the requirements of the various sizes and types of trucks. Much damage has been done to tires on trucks used by railways because of the improper care of the tires and improper use of the trucks, such as loading trucks beyond their recommended capacity and operating them when the tires are not properly inflated. It is my experience that this has been the chief reason for damage to tires on automotive equipment used by maintenance-of-way forces.

The added cost of purchasing special tires for use of trucks which are driven over rough terrain, such as right of ways, would not give sufficient added life to the tire to compensate for the extra expense of the special tires—unless the truck was operated in places where the ground was extremely rocky or rough. Under ordinary conditions, if the recommendations of the manufacturer in regard to tires is complied with, ordinary tires will give satisfactory service.

"Specials" Best in Long Run

By L. H. Taylor
Manager, Off-the-Road Sales, The B. F. Goodrich Company, Akron, Ohio

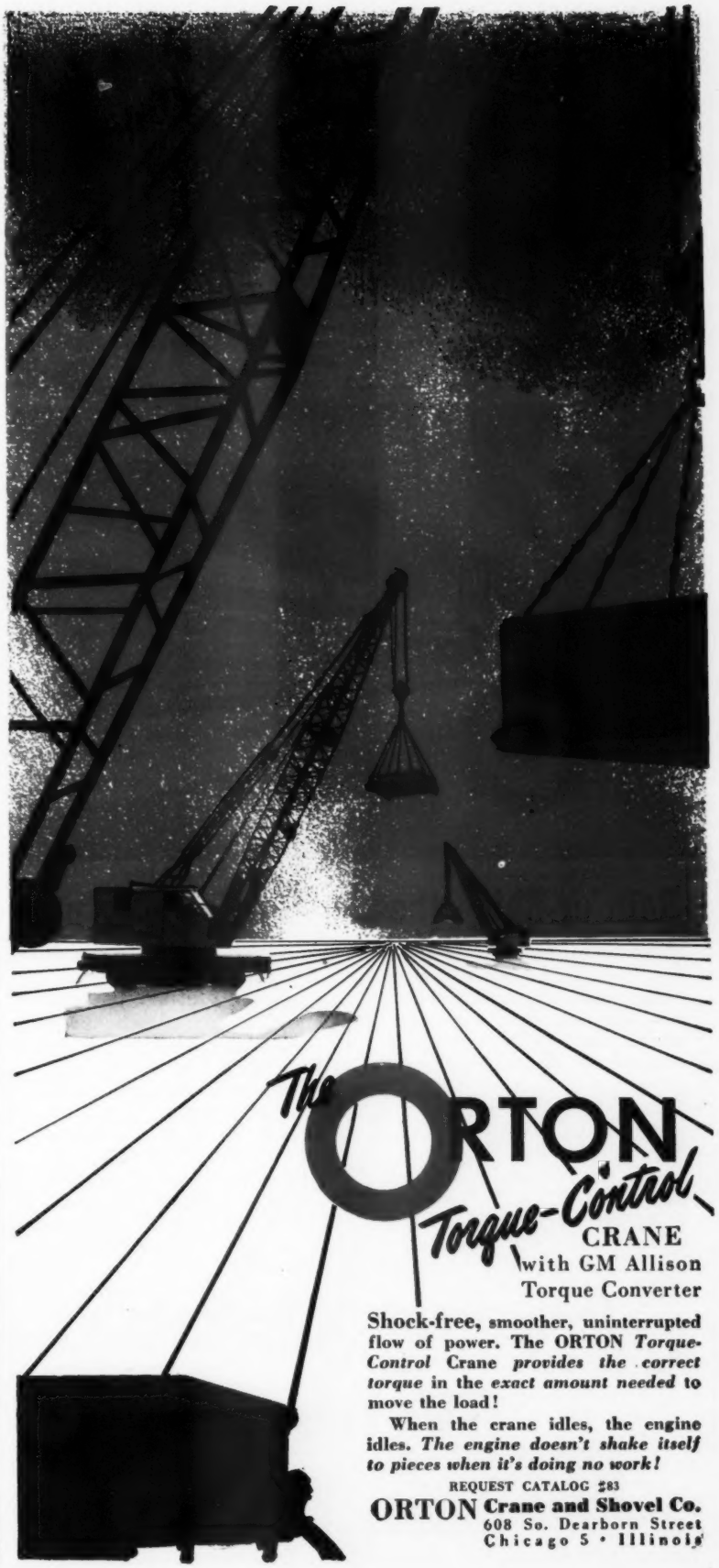
Tires especially designed for on-and-off-the-highway service should be used and most of the major tire manufacturers produce tires to do just this sort of job.

Most tires which operate only on highways are generally of the ribbed type in order to give long, even wear and traction in dirt or mud where special resistance to service in rock is not needed. On the other hand, a tire which is used on the highway, as well as over rough terrain off the highway, must not only possess some features of long and even wear, but also should have, for off-the-highway use, good traction qualities, such as a good, extra-strong cord body to prevent bruise breaks, and resistance to cutting.

One of the main reasons why such a special-purpose tire has been used in such operations at a saving of dollars and cents to the truck operator has been that it can be quite costly, as far as tires are concerned, to use regular highway-truck tires that do not have enough traction to get a truck through rough terrain. Tires which spin under such conditions really tear off the rubber and cause expensive delays. Only a few miles, or in some cases a few hundred yards, of off-the-road service can result in any tire, particularly a highway-type tire, being cut, bruised or otherwise damaged far more than many thousands of miles of service on the highway could cause.

If a truck gets off the highway only at very rare intervals and then over terrain that does not require traction or would not result in severe service, special tires need not be purchased. But the continued increase in sales throughout the industry of combination on-and-off-the-highway tires, such as our particular brand of all-purpose tires, indicates that for many on-and-off-the highway operations, a special tire has been economical in the long run for operators. In addition, these tires only cost about 10 per cent more than regular tires.

We publicize the fact that there are "nine ways to get more miles out of your truck tires." and publish a booklet that describes them. They include: (1) Proper tire selection; (2) correct inflation; (3) correct loading and load distribution; (4) correction of mechanicl irregularities; (5) proper matching and spacing of dual tires; (6) care of tubes; (7) regular tire rotation; (8) savings through recapping and repairing; and (9) careful driving habits. If owners and drivers follow these rules, they will increase the average mileage of their tires and thereby lower their truck-maintenance costs.


The ORTON
Torque-Control
CRANE
with GM Allison
Torque Converter
Shock-free, smoother, uninterrupted flow of power. The ORTON Torque-Control Crane provides the correct torque in the exact amount needed to move the load!
When the crane idles, the engine idles. The engine doesn't shake itself to pieces when it's doing no work!
REQUEST CATALOG 283
ORTON Crane and Shovel Co.
608 So. Dearborn Street
Chicago 5 • Illinois

PRODUCTS OF MANUFACTURERS

PNEUMATIC CONCRETE VIBRATOR

THE Independent Pneumatic Tool Company, Aurora, Ill., has a new air-operated concrete vibrator designed to compact freshly poured concrete and to direct movement of the concrete as it is poured into the form. Known as the Thor No. 521, the device consists of a combination air and exhaust hose, 5 ft. long, to one end of which is fastened a steel cylinder, 2¾ in. in diameter by 17½ in. long, containing a ball-bearing air motor and vibrating unit.

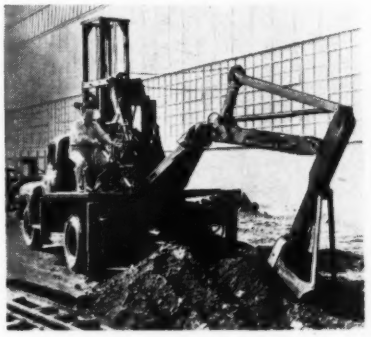
The principal features of the unit include an adjustable automatic air-line oiler, a roll-type throttle providing up to 8,000 vibrations per minute, and a steel sleeve around the vibrator unit which minimizes grease loss from the bearings.

The vibrator is available with combination air and exhaust hoses in lengths of 10 ft., 15 ft. and 20 ft., instead of the standard 5-ft. length,

if desired. Also available, as optional equipment, there is a 15-ft. length of extension air hose for use with the standard 5-ft. length of combination hose.

TRUCK-MOUNTED DRAG-SHOVEL

THE Bucyrus-Erie Company, Milwaukee, Wis., has announced a hydraulically-operated truck-mounted drag-shovel, called the Hydrohoe, designed for fast and easy trenching or other specialized digging work. One of the principal features of the machine is a telescoping boom which provides a digging motion entirely separate from the machine's primary digging action. By hydraulically extending and retracting the boom, the operator, according to the company, can make a level scallop-free cut



Rain or Shine these umbrellas stay up

These umbrella sheds at the Houston, Texas, passenger station of the Southern Pacific Lines have been in service seventeen years. The roof decking is constructed of Wolmanized* pressure-treated Lumber (150,000 board feet . . . 2" x 6" tongue and grooved). Despite exposure to conditions that favor decay, the Wolmanized Lumber remains as sound today as it was when first installed in 1934.

In addition to durability, Wolmanized Lumber is clean and paintable—so important for good appearance, especially in a passenger station. In these sheds, aluminum paint has been used to keep the roof undersurface bright and clean.

Service records, the only reliable gage of testing wood preservatives, have been kept on Wolmanized treated Lumber for over 20 years. Case histories are available on millions of feet used on American railroads. For a copy of the "Service Record" booklet write:

American Lumber & Treating Co.
General Offices: 1693 McCormick Bldg., Chicago 4, Illinois

*Reg. U. S. Pat. Off.

Branch Offices: Baltimore, Boston, Jacksonville, Fla., Little Rock, Ark., Los Angeles, New York, Portland, Ore., San Francisco

Wolmanized
PRESSURE TREATED
Lumber
Stops Rot and Termites

without moving the machine. The force for the primary digging action is applied by a hydraulic ram located between the boom and the dipper handle.

Another feature claimed for the machine is the precision with which it can be controlled. It is said that the dipper can be moved a fraction of an inch at a time, if necessary, when digging around pipes or underground cables. A third feature is a hydraulic ejector built into the dipper. This device pushes the load out of the bucket and thus eliminates the need of jerking or jarring to shed sticky material. It also makes possible the use of a narrow 12-in. bucket, a size often impractical because of clogging.

The Hydrohoe can dig to a depth of 12 ft. 6 in., has a maximum reach of 23 ft., and can travel over the road at speeds up to 50 m.p.h. All work functions are actuated by hydraulic pumps powered, through a power takeoff, by the truck engine. The machine can be converted to clamshell or crane service in the field.

IMPROVED SERIES OF GASOLINE HAMMERS

A SIMPLIFIED arrangement of parts, resulting in greater portability and increased operating convenience and efficiency, is reported

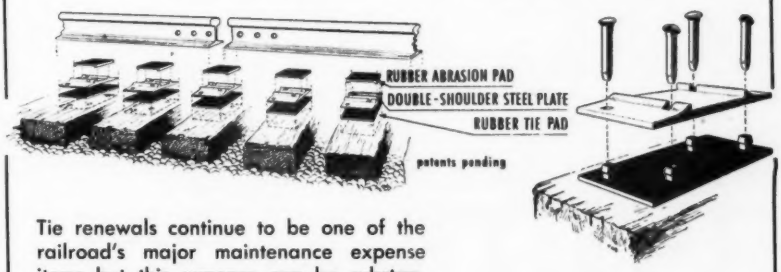
to be the outstanding feature of an improved series of gasoline hammers now being offered by the Barco Manufacturing Company, Chicago, for concrete breaking,

(Continued on page 842)

Track Maintenance and Maintenance Expenditures Better Controlled — Vastly Reduced

DOES YOUR BUDGET CONTAIN A GOOD SIZED APPROPRIATION FOR OUR

RUBBER TIE PADS?



Tie renewals continue to be one of the railroad's major maintenance expense items but this expense can be substantially reduced by extending tie service life through the use of our rubber tie pads. These rubber pads, which cost no more than others, will either eliminate or greatly reduce problems arising from broken rail ends, derailments, car rocking, cargo damage, low joints, loose spikes, rail creeping, impacts, shocks, high-frequency vibrations, track leveling, gage widening, drainage, and subzero temperatures.

These rubber pads are not only applicable to all main line installations, but are also particularly valuable where corrosive and abrasive conditions are severe, such as in tunnels, along the sea coast, around sulphur and other chemical plants, and on steel and concrete docks. They are also ideal for installation on ferry boats, gantry and overhead cranes, as well as where adverse electrolytical conditions exist.

These units are fast becoming standard for either yard or main line track, saving money through protection of ties and rails.

OUR NEW RUBBER TIE PADS

Sleeves on pad may be left off or purchased as a separate unit. These slee es:

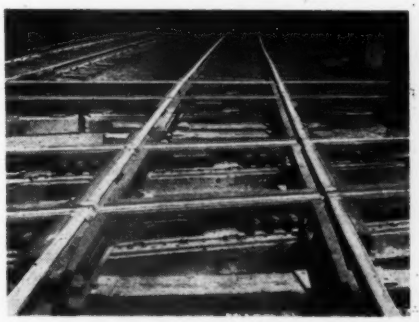
1. Cushion spike against rail rebound.
2. Seal spike hermetically and cushion it against lateral pressures. Original holding power maintained. No corrosion.

Spike hole in sleeve is 5/8" wide inside; overall width is 7/8", and at bead location is 7/8" to 9/10". Sleeve length extends 1/4" above steel tie plate. Bead rests on steel plate top surface for support, permitting spike entry. As spike is driven, excess rubber forms spike head cushion and perfect seal.

Normal moisture travel down spike to tie is stopped.

We have developed a new surface for our pads which eliminates movement between plate, rail, and tie, creating a strong, moistureproof bond between them.

On crossings, where maintenance is high, 1/4" pads between frogs and plates, and between plates and ties, will reduce costs greatly in extending life of frogs, rails, and ties.



Above: This crossing will have rubber pads directly under the rail and the base plates.

Railroad Rubber Products, Inc.

1628 EAST 45th ST. ASHTABULA, OHIO

1211 HARVEY BLDG. WEST PALM BEACH, FLA.

rock drilling, spading and tamping. The simplified parts arrangement was made possible through use of a new, highly-compact ignition coil-vibrator-condenser assembly.

The new ignition system, weighing only a few ounces, is located in the right handle of the hammer and requires a high-tension lead only about 5 in. long. In previous models, in contrast, the ignition coil, several times heavier and larger, was a separate part connected to the hammer by a heavy cable 10 ft. long. The reduction in the length of the high-tension lead afforded by the new system is said to have resulted in better ignition. The new system is also said to give a faster initial spark and quick easy starting under all weather conditions because the vibrator is of the continuous vibrating type and not dependent on time-point contact. The coil, vibrator and condenser are of sealed-type construction and are easily replaceable as units. The ignition switch is a new toggle type, conveniently located on the handle.

The electric source recommended by the company is a standard 6 - volt wet - cell automotive - type battery, although a 6-volt dry-cell battery may be substituted if desired. The new coil draws a current of only about 1 amp. as compared with the 2 amp. required for the previous coil. Hence, battery life has been increased. When not in use, the cable from the battery to the hammer can readily be disconnected.

The improved series of hammers includes a standard model (J-2), weighing 72 lb., and a heavy-duty model (H-6B), weighing 89 lb. Both models are powered by a single air-cooled two-cycle full-floating piston, and both deliver up to 1550 strokes a minute. Each hammer is put into operation by pushing down on a starting plunger located on the cylinder head.

In addition to the improved hammers themselves, Barco is also offering conversion kits for incorporating the new features into existing hammers.

LIBBEY-ZONE PROCESS

Cuts Open Deck Bridge Fires

What can be done about stopping costly bridge fire loss . . . and reducing the equally costly loss of time and disruption of schedules caused by bridge fires? America's leading rail systems (names upon request) have answered this all-important question by adopting the LIBBEY-ZONE PROCESS.

To date, 19 railroads have adopted the LIBBEY-ZONE PROCESS . . . applied on about one-half million lineal feet of bridge decks.

The LIBBEY-ZONE PROCESS provides for covering the exposed, fire-hungry wooden surfaces with ZONE HEAVY-DUTY asphalt compound to which is applied a layer of gravel aggregate. Exhaustive tests prove this method superior to any other fire resistant method in use today. The cost is low; and the upkeep cost is almost non-existent.

Illustrated Booklet
Full Details — Without Obligation

The ZONE COMPANY . . . exclusively offering the LIBBEY-ZONE PROCESS . . . invites your inquiries. An interesting illustrated booklet explains and demonstrates the process in detail. Specific questions and problems are also invited. Write today . . . no obligation, of course.

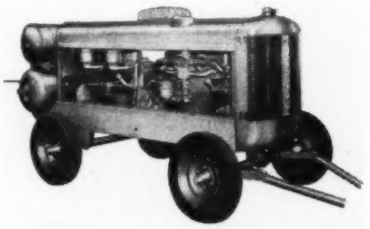
Weather Protection for Cross Ties . . .

The LIBBEY-ZONE PROCESS increases the useful life of cross ties and wood members. The asphalt compound penetrates deeply into the wood, preventing rot from seeping moisture.

THE ZONE COMPANY
A Division of the Southwestern Petroleum Company
Fort Worth 1, Texas

AIR COMPRESSOR

THE latest addition to the line of air compressors manufactured by Schramm, Inc., West Chester, Pa., is a unit called the Model 210 Unistage, which consists of a six-



cylinder engine and a six-cylinder compressor unit with an actual air delivery of 210 c.f.m. One of the important features of the new model is a simplified design in which 90 per cent of the engine parts are interchangeable with the compressor. It is pointed out that this design eliminates two-staging and intercoolers and requires a fewer number of parts.

Other features of the compressor include a Pneumostat control, electric starting, speed control, cam-operated mechanical intake valves, and dual fan belts.

THE MONTH'S NEWS

Railway Personnel

General

John W. Demcoe, engineer maintenance of way of the Central region of the Canadian National, at Toronto, Ont., has been appointed superintendent of the Hornepayne division, at Hornepayne, Ont.

H. W. Waters, trainmaster of the Macon division of the Central of Georgia, at Macon, Ga., and formerly track supervisor on that division, has been promoted to superintendent of the same division.

Engineering

James C. Boyle, assistant chief engineer of the Central Vermont, has been promoted to chief engineer, with headquarters as before at St. Albans, Vt.

B. V. Bodie, superintendent of the Gulf, Mobile & Ohio at Bloomington, Ill., has been promoted to chief engineer, with headquarters at Mobile, Ala.

F. J. Farish, assistant to district engineer of the Alberta district of the Canadian National, has been promoted to division engineer of the Calgary division, with headquarters at Calgary, Alta., succeeding **H. W. Tooker,** who has retired.

William R. Marshall, assistant engineer of structures on the Erie, at Cleveland, Ohio, has retired after 33 years of service. **P. C. Chamberlain,** assistant engineer, has been promoted to assistant to engineer of structures.

H. J. Langlois, acting division engineer on the Delaware & Hudson, has been appointed division engineer of the Champlain division, with headquarters as before at Plattsburg, N. Y. **C. W. Reeve,** division engineer, on leave of absence, has resigned to accept employment elsewhere.

John W. Kidd, assistant division engineer on the Southern at Knoxville, Tenn., has been promoted to division engineer, with headquarters at Louisville, Ky. **Edward H. Cook,** bridge and building supervisor, at Bristol Va., has been advanced to assistant division engineer to succeed Mr. Kidd.

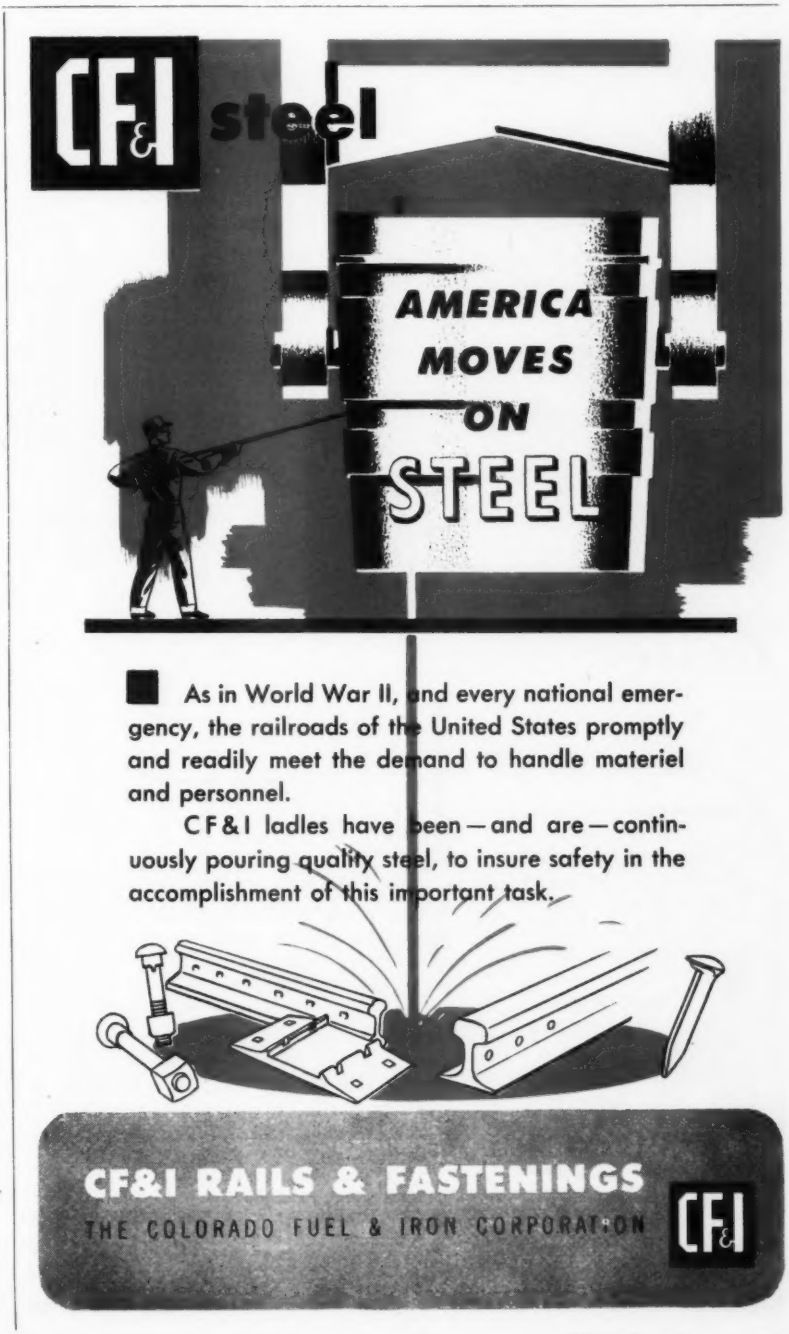
K. Huffman, engineer of construction and fire prevention for the Central region of the Canadian National, has been appointed chief engineer of that region, with headquarters as before at Toronto, Ont., succeeding **E. R. Logie,** who has retired. **G. H. Workman,** acting assistant engineer of construction, succeeds Mr. Huffman.

J. R. Alcorn, senior assistant engineer of the North Florida division of the Seaboard Air Line at Jacksonville, has been appointed division engineer of the Alabama division at Americus, Ga., succeeding **W. R. Fudge,** who has been transferred to the North Florida division at Jacksonville to replace **C. H. Burks,** who has resigned.

L. F. Pohl, assistant engineer on the Chicago, Milwaukee, St. Paul & Pacific at Chicago, has resigned to accept the position of office engineer, way and structures of the Chicago, South Shore & South Bend, with headquarters at Michigan City, Ind. **C. R. Merriman** has been appointed engineer, maintenance of way and structures of the C.S.S.&S.B., with headquarters also at Michigan city.

J. R. Prizer, engineer maintenance of way and structures of the Central of New Jersey, at Jersey City, N. J., has retired.

J. M. Minturn, who has been promoted to asssistant division engineer on the Pennsylvania at Altoona, Pa., as announced in the July issue, was born at Cincinnati, Ohio, on March 5, 1911, and, following graduation from the University of Cincinnati in civil engineering, he entered the employ of the Pennsylvania on January 16, 1935, as an assistant on the engineer corps at Fort Wayne, Ind., subsequently serving in that capacity at various other locations. On February


CF&I steel
AMERICA MOVES ON STEEL
As in World War II, and every national emergency, the railroads of the United States promptly and readily meet the demand to handle materiel and personnel.
CF&I ladles have been—and are—continuously pouring quality steel, to insure safety in the accomplishment of this important task.
CF&I RAILS & FASTENINGS
THE COLORADO FUEL & IRON CORPORATION
CF&I

Railway Personnel (Cont'd)

24, 1939, Mr. Minturn was appointed assistant supervisor of track on the Philadelphia Terminal division and on July 23, 1941, was promoted to supervisor of track on the Cleveland division. He was transferred to the Philadelphia Terminal division on July 1, 1945, where he remained until his recent appointment.

H. O. Waddell, division engineer of the Toronto Terminals division of the Canadian National, has been appointed district engineer of the Northern Ontario district at North Bay, Ont., to succeed **H. J. Fast,** whose appointment as engineer maintenance of way of the Central region at Toronto was announced in the August issue. **A. J. Latyn,** assistant division engineer, Toronto Terminals, has been appointed acting division engineer, succeeding Mr. Waddell. Mr. Fast was born at Puchova, Russia, on February 12, 1913, and received a Bachelor of Science degree in geology in 1940 from the University of Saskatchewan, after having entered railroad service in 1938 as continental representative of the C.N.R. in Central Europe, Baltic states and Scandinavian countries. In 1940 he became resident engineer and geologist for the Negus Gold Mines at Yellowknife, Canadian Northwest Territories. In 1941 Mr. Fast was appointed instrumentman; in 1942, assistant engineer; in February 1946, assistant division engineer; and in August 1946, division engineer, all on the C.N.R. He became district engineer of the Northern Ontario district at North Bay in October 1948, which position he held until recent appointment.

H. J. Fast

T. Z. Krumm, chief engineer of the Minneapolis, St. Paul & Sault Ste. Marie, and also chief engineer of the Duluth, South Shore & Atlantic, with headquarters at Minneapolis, Minn., retired on July 21. He is succeeded as chief engineer of the Soo Line by **L. V. Johnson,** district engineer at Minneapolis, and as chief engineer of the D.S.S.&A., by **S. P. Berg,** division engineer at Marquette, Mich.

Mr. Krumm was born at Columbus, Ohio, July 20, 1881, and shortly after graduating from Ohio State University in civil engineering in 1902, he secured his first railroad job as resident engineer on the Chicago Great Western. Later he served with the Northern Pacific for 10 years and with the Chesapeake & Ohio for two years, and in 1917 went into the U. S. Army as captain of engineers. Discharged from the army in 1919, he re-entered the service of the N.P., acted as assistant on valuation work until May 1920, when he joined

T. Z. Krumm

faster track cleaning with a LODOVER

1 yard Combination Overhead and Front End Shovel for INTERNATIONAL TRACTORS

Attachments for Many Jobs . . .

Here's a time-saving, cost-cutting unit for ALL railway construction and maintenance jobs! Overhead loading eliminates turns over tracks—works more miles per day—reduces maintenance costs . . . Dozer blade and boom (up to 10,000 lbs. capacity) easily attached for right-of-way and construction work. "No-turn" overhead loading means faster, more economical work on ALL railway jobs!

MANUFACTURING DIVISION
SERVICE SUPPLY CORPORATION
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LODOVER Sold by Your INTERNATIONAL HARVESTER INDUSTRIAL POWER DISTRIBUTOR

the Soo Line's engineering department as principal assistant engineer. He became chief engineer in 1936.

William M. Jaekle, whose promotion to assistant engineer maintenance of way and structures of the Southern Pacific was announced in the August issue, was born at Portland, Ore., August 25, 1912. He obtained his higher education at Stanford University, from which he was graduated in 1934 with a degree in civil engineering. Joining the S. P. later in the same year, Mr. Jaekle worked subsequently in various positions ranging from rodman to assistant engineer until 1939, when he became engineer-inspector on the Redding-Delta line relocation. He was promoted to assistant division engineer in 1940, division engineer in 1943, and construction engineer on the

William M. Jaekle

Meridian line relocation in 1948. He was serving in the latter capacity at the time of his recent promotion to assistant engineer maintenance of way and structures.

Track

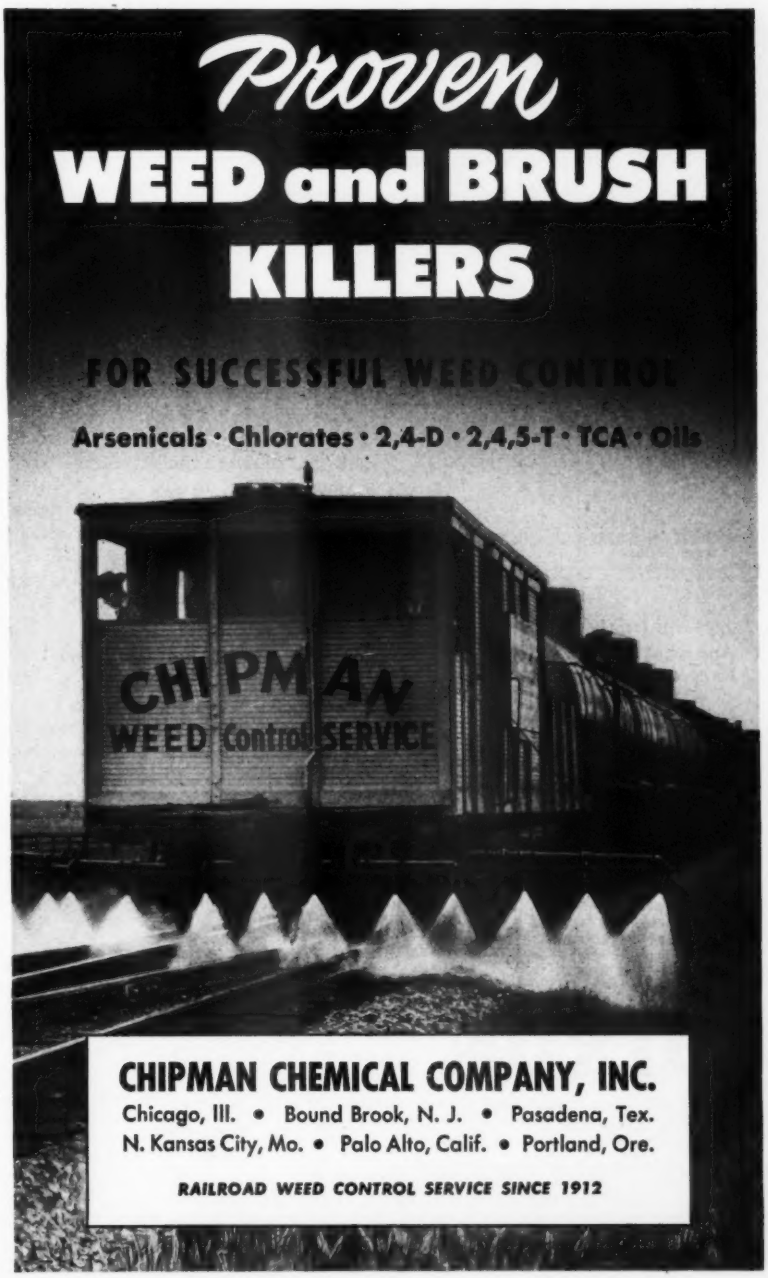
John O. Bell, section foreman on the Southern, has been promoted to assistant track supervisor, with headquarters as before at Gastonia, N. C. **Earnest H. Addington,** assistant foreman at Charlotte, N. C., has been advanced to assistant track supervisor at Spartanburg, S. C.

J. H. Crenshaw, roadmaster on the Atlantic Coast Line at Fayetteville, N. C., has been appointed general roadmaster of the Northern district, Northern division, with headquarters at Rocky Mount, N. C. **W. M. Tharp,** roadmaster at Wilmington, N. C., has been transferred to Fayetteville to succeed Mr. Crenshaw, and **A. C. Low, Jr.,** has been appointed roadmaster at Wilmington to succeed Mr. Tharp. **R. C. Sharpe,** roadmaster at Jesup, Ga., has been transferred to Petersburg, Va., to replace **J. D. Styles,** who has been assigned to other duties.

R. Paul Thornburg, supervisor of track on the Southern at Clinton, Tenn., has been transferred to Athens, Tenn., succeeding **James B. Starr,** who has replaced Mr. Thornburg at Clinton. **Millard M. Fisher, Jr.,** student apprentice in the office of chief engineer maintenance of way and structures at Cincinnati, Ohio, has been promoted to assistant track supervisor at Slidell, La. **Lee K. Walker,** foreman at Bristol, Va., has been advanced to assistant track supervisor at Gate City, Va. **David Wetterau** is now track supervisor at Danville, Ky., not Danville, Va., as reported in the July issue.

H. E. Pietgen, junior engineer on the Columbus division of the Pennsylvania, has been promoted to assistant supervisor of track at Williamsport, Pa., succeeding **F. O. Johnson,** who has been transferred to Orrville, Ohio. Mr. Johnson succeeds **M. L. Hersey,** who has been transferred to the office of chief engineer at Pittsburgh, Pa. **J. G. Ennace,** general foreman, rail train, Central region, has been promoted to assistant supervisor of track at Trafford, Pa., succeeding **C. L. McElheny,** who has been promoted to supervisor of track at Carrothers, Ohio. Mr. McElheny succeeds **H. J. Preston,** who has been transferred to Bradford, Ohio, to replace **P. T. Trax,** who has resigned. **F. H. Ford, Jr.,** junior engineer on the Maryland division, has been promoted to assistant

(Continued on page 846)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KILLERS
FOR SUCCESSFUL WEED CONTROL
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WEED Control SERVICE
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Chicago, Ill. • Bound Brook, N. J. • Pasadena, Tex.
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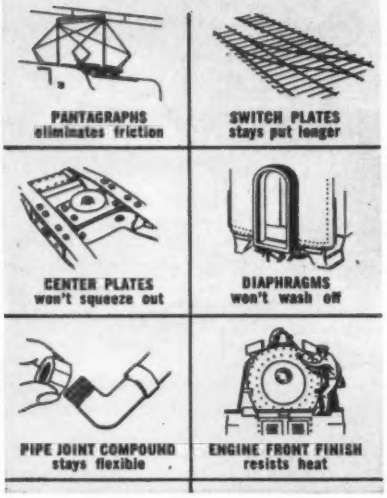
RAILROAD WEED CONTROL SERVICE SINCE 1912

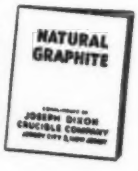
everything works better with Dixon Graphite!

FOR EXAMPLE:



Use Dixon *Natural* Graphite for your TOUGH lubricating jobs! And what a job it will do for you! Rain and hosings won't wash it off – withstands extremes of heat and cold – won't squeeze out under pressure. Chemically inert, too. And doesn't pick up road dust or dirt.

SEND FOR FREE SAMPLE of Dixon 1924 – Quick Drying Lubricant. Try it – it's an effective, long lasting dry lubricant, superior to oil and grease for many applications. Also, ask for your copy of technical report "Natural Graphite." Joseph Dixon Crucible Company, Jersey City 3, N. J.



DIXON

NATURAL GRAPHITE

• 1924 Quick Drying Lubricant • Center Plate Lubricant • Graphite Seal • Pipe Joint Compound • Brake Cylinder Lubricant • Engine Front Finish • Graphite for Compounding • Lathe Center Lube

Railway Personnel (Cont'd)

supervisor of track at York, Pa., succeeding **F. R. Matthews,** who has been transferred to Wilmington, Del., to replace **C. G. Weinel,** who has resigned. **R. D. Radcliffe,** general track foreman at Downingtown, Pa., has been promoted to assistant supervisor of track there to replace **C. E. Geedey,** who has been promoted to supervisor of track at Wilkes Barre, Pa. Mr. Geedey succeeds **G. W. Sturgeon,** who has been assigned to other duties.

H. C. Archdeacon, junior engineer on the Philadelphia Terminal division, has been promoted to assistant supervisor of track at Lancaster, Pa., succeeding **G. S. Lehman,** who has been advanced to supervisor of track at Wheeling, W. Va. **J. W. Fuller,** junior engineer at Derry, Pa., has been promoted to assistant supervisor of track at Northumberland, Pa., succeeding **J. M. Morgan,** who has been transferred to Perryville, Md. **W. D. Streiff,** assistant supervisor of track at Cleveland, Ohio, has been transferred to Dennison, Ohio, replacing **J. S. Kay,** who has been advanced to supervisor of track at Cleveland. **D. J. Bean,** junior engineer at Mansfield, Ohio, and **L. P. Ruch,** junior engineer at Philadelphia, have been promoted to assistant supervisors of track at Cleveland. **P. N. Kulick,** assistant supervisor of track at Mansfield, has been appointed supervisor of track at Carnegie, Pa., succeeding **L. D. Freeman,** who has been transferred to Erie. **E. M. Bissinger,** junior engineer on the Southwestern division, has been promoted to assistant supervisor of track to succeed Mr. Kulick. **D. G. Avoletta,** assistant supervisor of track at Trenton, N. J., has been appointed acting supervisor of track at Jersey City, N. J.

Bridge and Building

Dennis N. Shrum, foreman on the Southern at Greenville, S. C., has been promoted to assistant bridge and building supervisor at Charlotte, N. C.

Obituary

Marshall A. Carson, retired track supervisor on the Southern, died recently.

E. A. Garten, retired division engineer on the Chesapeake & Ohio, died recently at Huntington, W. Va., at the age of 83.

L. P. Carlson, roadmaster on the Chicago, Burlington & Quincy, with headquarters at North La Crosse, Wis., died recently.

C. P. LeSueur, trainmaster on the Central of Ga., at Albany, Ga., and formerly track supervisor at Eufaula, Ala., and the Macon terminals, died on July 20 at the age of 48.

Association News

American Railway Engineering Association

A total of 15 committees has scheduled meetings to be held in September, of which 11 will hold their meetings at the Hotel Stevens, Chicago, during the concurrent conventions of the Roadmasters' Association and the American Railway Bridge and Building Association, September 17-19. These 11 committees include those on Roadway and Ballast, which will meet on September 17-18; Rail, September 18; Track, September 18-19; Masonry, September 18-19; Highways, September 18-19; Records and Accounts, September 18-19; Railway Location and Operation, September 18; Uniform General Contract Forms, September 18-19; Cooperative Relations with Universities, September 18 (tentative); Maintenance of Way Work Equipment, September 17-18; and Clearances, September 18.

Meetings and Conventions

American Railway Bridge and Building Association—Annual meeting September 17-19, 1951, Stevens Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn Street, Chicago 5.

American Railway Engineering Association—Annual Meeting, March 11-13, 1952, Chicago. Neal D. Howard, Secretary, 59 E. Van Buren Street, Chicago 5.

American Wood-Preservers' Association—H. L. Dawson, Secretary-treasurer, 839 Seventeenth Street, N. W., Washington 6, D. C.

Bridge and Building Supply Men's Association—L. R. Gurley, Secretary, 201 North Wells street, Chicago 6.

Maintenance of Way Club of Chicago—E. C. Patterson, Secretary-treasurer, Room 1512, 400 W. Madison street, Chicago 6.

Metropolitan Maintenance of Way Club—Secretary, 30 Church street, New York.

National Railway Appliance Association—Robert A. Carr, Secretary, 310 South Michigan avenue, Chicago 4; Lewis Thomas, Assistant Secretary, 59 East Van Buren street, Chicago 5.

Railway Tie Association—Annual meeting September 26-28, 1951, Netherland Plaza Hotel, Cincinnati, Ohio. Roy M. Edmonds, Secretary-treasurer, 912 Shell Building, St. Louis 3, Mo.

Roadmasters' and Maintenance of Way Association of America—Annual Meeting September 17-19, 1951, Stevens Hotel, Chicago. Elise LaChance, Secretary, 431 S. Dearborn street, Chicago 5.

Track Supply Association—Lewis Thomas, Secretary, 59 E. Van Buren street, Chicago 5.

Other committee meetings scheduled for September include those on Water Service and Sanitation, which will meet at association headquarters, Chicago, September 21; Yards and Terminals, Denver, Col., September 23-24-25; Wood Preservation, Netherlands Plaza Hotel, Cincinnati, Ohio, September 26; and Continuous Welded Rail, association headquarters, Chicago, September 11.

Supply Trade News

General

The **Bucyrus-Erie Company,** South Milwaukee, Wis., is reported to be taking steps toward acquiring the **National Erie Corporation,** Erie, Pa. in order to expand production space. Bucyrus-Erie already has a plant at Erie, and if the National Erie plant is acquired, it will be used entirely to provide added foundry and machine shop space for the production of Bucyrus-Erie equipment.

A new aluminum smelting plant, said to be the first in history to use lignite (sub-bituminous coal) for fuel, will be built by the **Aluminum Company of America.** Application has been filed to begin construction of the plant in the immediate future at one of several alternate locations approximately 60 miles south of Waco, Tex. Production of metal is expected to start in the early fall of 1952, with a capacity of 85,000 tons of aluminum annually.

Personal

Leonard J. Fletcher, formerly director of training and community relations of the **Caterpillar Tractor Company,** Peoria, Ill., has been elected a vice-president. **Ralph J. Morgan,** assistant to the president, has been appointed executive assistant. Mr. Fletcher joined Caterpillar in January 1927 as director of agricultural sales. He was appointed assistant general sales manager in 1937 and director of training in 1941. Seven years ago his duties were increased to include direction of the company's community relations division.

Leonard J. Fletcher

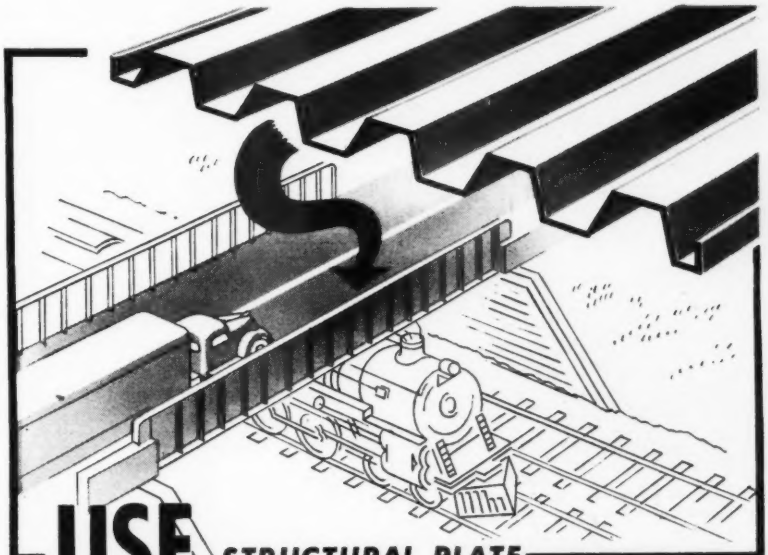
The Robert W. Hunt Company, Engineers, has announced the promotion of **L. F. Bross** to manager of the Rail and Track Fastenings department, succeeding **A. A. Bareuther,** who has been granted a leave of absence due to ill health.

B. N. Johnson, manager of procurement of the Wood Preserving division of **Koppers Company, Inc.,** with headquarters at Richmond, Ind., retired on August 1. Most of his former responsibilities have been taken over by **H. H. Ost,** at the Marietta (Ohio) procurement office of the Wood Preserving division.

Stephen P. Murphy has been appointed assistant to the president, a newly-created post, of the **Matisa Equipment Corporation,** with headquarters at Chicago.

Paul M. Fischer, formerly factory manager of the **Hyster Company,** at Peoria, Ill., has been promoted to chief methods engineer, with headquarters at Portland, Ore.

(Continued on page 848)



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PROOF THAT

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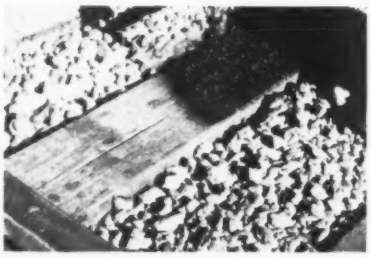
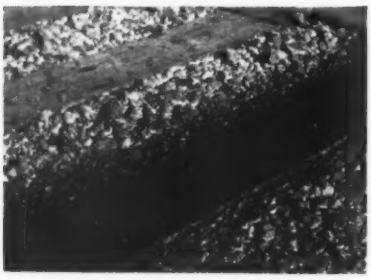


How weathering threatens the life of a comparatively new cross-tie



See how Protek-coat has coated and insulated the cross-tie shown above. Another "save" for Protek-coat.

Compare the two pictures shown. See how just one coat of PROTEK-COAT has completely filled up the cracks in the tie and is insulating the top surface from damage by sun, rain and other weather elements. PROTEK-COAT not only safeguards ties against weather ravage, it also acts as a FIRE RETARDANT . . . protecting ties and timbers from sparks, live coals, hot splinters and fusees. In addition, PROTEK-COAT withstands the action of brine drippings and light sulphuric acid . . . thus protecting steel portions of bridges. For free folder giving specifications and applications of PROTEK-COAT, write or phone today.

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Supply Trade News (Cont'd)

J. G. Wallace, who, as reported in the July issue, has been appointed assistant manager, railway traffic and sales department, Texas Company, with headquarters at New York.

P. A. Wedding, professor of civil engineering at the University of Maryland, has joined the laboratory staff of the **Timber Engineering Company** in a consulting capacity. Prof. Wedding will be engaged in designing various types of railroad ties, which is part of the railway tie project being conducted for the National Lumber Manufacturers Association and the A.A.R.

A. H. Borchardt has been elected a vice-president of the **Worthington Pump & Machinery Corp.,** with overall responsibility for sale of the corporation's entire line of pumping equipment, including centrifugal, reciprocating and vertical turbine pumps. Mr. Borchardt was graduated from Columbia University with a mechanical engineering degree, after which he joined Worthington's erecting and testing department. After

A. H. Borchardt

working successively as draftsman, field engineer and sales engineer, he was appointed assistant manager of the centrifugal pump sales department in 1921 and manager in 1928. Subsequently, he was appointed, successively, sales

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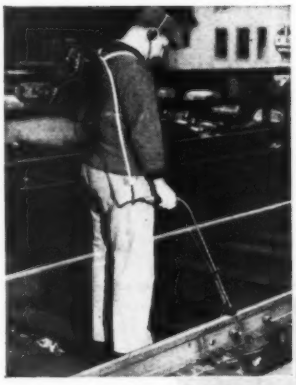

probes rail-in-track anywhere —

at joint bars, frogs, switch-points, crossings and platforms, in tunnels

for flaws you cannot see.

Ultrasonic Resonance signals defects invisible to the eye, before they reach dangerous size. With the new Long-Handled Searching Unit to speed the work and reduce fatigue, two-man crews of Operator and Watchman have made

from 800 to 1000 checks per 8-hour day.

Used by most Major Railroads

BRANSON INSTRUMENTS, Inc.
Department 432 Stamford, Connecticut, U.S.A.

C. S. White, who has been appointed manager of the western division of the Dearborn Chemical Company at New York, to replace the late Herbert J. Cornell, formerly vice-president, eastern division, whose death is reported elsewhere in these columns. Mr. White was formerly manager of the Eastern division water treatment department.

manager of the Harrison, N. J., plant, manager of the commercial engineering department and, in 1934, assistant vice-president and manager of centrifugal pump application and sales division.

W. C. Spruce, direct factory representative of the spray painting and finishing equipment division of the **DeVilbiss Company,** has been promoted to Southwest district manager, with headquarters at Dallas, Tex. In his new position, Mr. Spruce will supervise the company's sales activities in the newly created Southwest district, which includes the states of Texas, Louisiana, Mississippi, Arkansas, Oklahoma, New Mexico, a section of western Tennessee and northwestern Alabama.

E. C. Marsh, president of the Fort Wayne (Ind.) division of **Bowser, Inc.,** has announced his resignation, effective August 31, after 42½ years of service with the company. **J. P. Orchard,** executive vice-president, has been elected president to succeed Mr. Marsh, who will continue to serve as a member of the board of directors.

Mr. Orchard joined Bowser, Inc., at Fort Wayne in 1940 as controller, becoming treasurer and later executive vice-president of the Fort Wayne division. Prior to his association with the company, he was engaged as a management consultant in various manufacturing and distributing enterprises.

Obituary

William C. Johnson, 49, executive vice-president of the Allis-Chalmers manufacturing Company, died on July 26.

Herbert J. Cornell, 61, vice-president of the Dearborn Chemical Company, eastern division, of New York, died on July 13.

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BURRO DOES EVERY JOB EFFICIENTLY, ECONOMICALLY

Whether the Burro is used to speed track laying or relocation, for bridge building, earth or ballast handling or on locomotive coaling jobs, it will handle every job more efficiently and economically—because Burro Cranes are built for railroad work.

Only **BURRO** *cranes have:*

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- *Elevated Boom Heels for working over high sided gondolas.*
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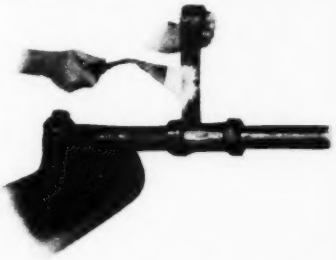
One Gravely Tractor with the proper attachments will make one man as effective as eight!

All-gear drive, power reverse. Works on steep slopes, rough ground. Railroad-tested for 30 years. Free Booklet, "Power vs Drudgery" tells how Gravely POWER frees your men for other work, increases efficiency, saves maintenance dollars. Write for it today!

Gravely Motor Plow & Cultivator Co.
BOX 942 DUNBAR, WEST VIRGINIA

More and more railroad maintenance men are depending on TAPECOAT to protect pipe joints and short pipe sections in underground service, at bridge crossings and wherever corrosion is a problem.

TAPECOAT is the coal tar protection in handy tape form. It comes in widths of 2, 3, 4, and 6 inches for spiral wrapping; and in widths of 18 and 24 inches for cigarette wrapping of large diameter pipe, tanks, etc.



Application is quick, easy, economical. Just a flash of a torch and TAPECOAT provides a perfect lasting bond to seal out the elements of corrosion.

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Our railway spring washers far more than pay for themselves by reducing maintenance costs—and in addition they *improve* your track.

Millions of Hipowers are in use today helping to prevent the battering of rail ends, absorbing shocks and stresses, equalizing bolt tensions, and keeping joints resilient.

Because of their great reserve power, your bolts need retightening far less frequently.

IMPROVED HIPOWERS IMPROVE TRACK

NATIONAL LOCK WASHER COMPANY, NEWARK 5, N. J., U. S. A.

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PREVENT FROZEN JOINTS, KINKS, PULL-IN-TWOS and CORROSION

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RAILROADS everywhere report virtual elimination of these costly ills when rail joints are packed with *Texaco 904 Grease* and sealed with *Texaco Plastic Material "H."* Texaco Rail Joint Lubrication seals out dirt, moisture and brine drippings from reefers.

Application is simple, quick and done under traffic, without taking the joint down. First, seal joint ends with *Texaco Plastic Material "H."* Then pump *Texaco 904 Grease* into the joint through an applicator pipe. The protection lasts for about five years. The savings in track maintenance are many times the small initial cost of Texaco Rail Joint Lubrication.

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Try these two other Texaco Railway cost-savers:

1. Texaco asphalt-cement pressure grouting, using *Texaco No. 24 Emulsified Asphalt*—stablizes "soft track" better, faster, for less.
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